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THE LANCET

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

OK NHL

IN TWO VOLUMES ANNUALLY.

VOL. CCXVI.

VOL. I. FOR 1929.

ONE HUNDRED AND SEVENTH YEAR.

EDITED BY

SIR SQUIRE SPRIGGE, M.D. CANTAB., F.R.C.P. LOND., F.R.C.S. ENG.,

AND

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LONDON

PUBLISHED BY THE PROPRIETORS, THE LANCET LIMITED, NO. 423, STRAND, AND NO. 1, BEDFORD STREET, STRAND, IN THE COUNTY OF LONDON, AND PRINTED BY HAZELL, WATSON & VINEY, LTD., 52, LONG ACRE, W.C.2.

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			857–908	„ 27th	5513	1337–1390	„ 29th	5522

PUBLISHED BY THE PROPRIETORS, THE LANCET LIMITED, No. 423, Strand, and No. 1, Bedford-street, Strand, in the County of London, and printed by HAZELL, WATSON & VINEY, LTD., 52, Long Acre, W.C. 2.

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1929
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Silvanus Thompson Lecture

[ABRIDGED]

ON

RADIOLOGY FROM A SURGEON'S STANDPOINT.

Delivered before the Institute of Radiology

BY W. SAMPSON HANDLEY, M.S. LOND., F.R.C.S. ENG.,

SENIOR SURGEON TO THE MIDDLESEX HOSPITAL.

FOR the privileged position I occupy on this occasion I can at least claim one qualification—namely, that the span of my professional life coincides almost to a year with the history of radiology so far as it has yet been written. In 1896 the present Sir Frederick Hopkins, then on the teaching staff of Guy's Hospital, as an enthusiastic amateur of the new science, had acquired a primitive X ray set. At his request and in my capacity of house surgeon I collected a group of five cases supposed with varying degrees of probability to have needles embedded in their hands. As the screen had no dark camera attached it was necessary to turn the gas very low, ignoring the offensive fumes which the Argand burner under such conditions produces. Moreover, the insulation of high tension wires was at that date absent or imperfect. The demonstration was successful; an embedded needle was clearly seen in every case, and was marked upon the skin. In other words, five cases, previously undiagnosable, were diagnosed by the new method. The patients were told to come up for operation next day, but not a single one returned to the scene of the diabolical séance at which he had assisted, where in a dark and evil-smelling chamber there had appeared before him a mysterious green globe of light, the operation of which was attended by painful electric shocks and by the awful vision of his own skeleton.

It seems difficult to believe that the distance separating this primitive phase from the radiography of the present day with its instantaneous deep pictures, and its powers of recording the phases of moving viscera such as the stomach and the heart, can have been traversed in the short space of 35 years. I note in passing that the first motion pictures of the heart and limbs were produced in this country by Dr. Russell Reynolds.

The progress made would have been impossible without the coöperation of the physicists, among whom the first President of the Rontgen Society, after whom the present lecture is named, must ever hold an honoured place. To-day the physicist is more-eminent as the authentic medicine-man of the tribe. His achievements paralyse our powers of wonder, otherwise they would become intolerable. Moving confidently about in a universe totally unappreciable to any of his senses, at one moment burrowing in the interior of an atom, at another creating vast, and some think unnecessary, disturbances in the all-pervading ether, he has asserted his mastery and proved his incredible statements by making the electron the humble servant, messenger, musician, artist, and plaything of man. It is becoming clear that in some respects the imaginative faculties of a poet compared to the disciplined imagination of a great scientist are as a child's first lispings compared to the rational utterance of a grown man.

A special word of recognition is due to that very small band of physicists who have forsaken the cold joys of pure intellection to serve sick humanity. I may be allowed to recall with satisfaction that the Middlesex Hospital, which I have the honour to serve, was the first hospital to appoint a physicist upon its staff in the person of Prof. Sidney Russ, and St. Bartholomew's Hospital in the appointment of Prof. F. L. Hopwood has followed this sound example. To the pioneers of medical radiology who plunged into the unknown territory determined to fathom its secrets at any cost, sufficient honour can never be paid. Many of them continued their work long after they knew the inevitable penalty of doing so. And on this occasion, with a sense of loss which the lapse of time fails to dull, I recall the memory of my friend Cecil Lyster. During the past year radiology has suffered a heavy loss in the death of Dr. Robert Knox. He was wise in council with that mixture of enterprise and caution which is the mark of his countrymen, skilful with his pen, cautious in his judgments, systematic and original in his method of work. In the judgment of the world outside, as well as in that of Britain, he was at the time of his death one of the foremost radiologists.

THERAPEUTIC RADIOLOGY.

Time will not allow me to recount the advances of diagnostic radiology which in recent years have made the thorax and the skull as transparent as the limbs. It may still be doubted whether some medical practitioners make use of diagnostic radiology to the full extent demanded by the interests of their patients. But the advance made can be measured by one simple fact. The doctor nowadays who treats a fracture or a severe sprain without insisting upon a radiograph places himself out of court.

Recent years have seen a striking enlargement of the field of therapeutic radiology, and I cannot attempt a systematic survey of the progress made. Confining myself to diseases which come under the surgeon's eye I have first to consider certain non-malignant but precancerous conditions.

Chronic Mastitis.

Chronic mastitis is of special interest to me because I believe I was the first to advocate its treatment by X rays in a paper on the prophylaxis of breast cancer contributed to the *Practitioner* in April, 1910. It may be said to-day that X rays have fully established their position as the most effective therapeutic agent for chronic mastitis. In support of this opinion I could call in the authority of a number of well-known radiologists, with whom I have been associated in the treatment of cases, and especially of Dr. G. B. Batten, Dr. Russell Reynolds, Dr. Douglas Webster, and Dr. Stanley Melville. A long course of treatment is not as a rule required. Not only do X rays relieve pain, but the mastitic swellings frequently disappear entirely and the breast returns to the normal. Radiation is, however, comparatively ineffective in the cystic form of the disease, and for this when it occurs in middle age operation is still often necessary. X rays may aggravate subacute mastitis and must be used with great caution in this condition. In acute mastitis they are contra-indicated. Among the large number of cases of chronic mastitis which I have sent for X ray treatment there are three who developed cancer in the breast during or after the treatment. But for some years past no such case has occurred, a token, I think, of the increased efficiency of X ray treatment.

Chronic mastitis, or duct catarrh of the larger ducts which is closely allied to it, is a frequent precursor of cancer of the breast, and significantly affects by choice the same quadrant of the breast, the upper and outer one. In duct catarrh of the breast certain of the main ducts are choked by masses of shed epithelium, the product of the undue activity of their lining membrane. The ducts near the nipple are palpable as tortuous cords. Around the affected ducts there is newly formed fibrous tissue associated with areas of round-celled infiltration. The contraction of this fibrous tissue produces four clinical danger signals—namely, (1) axial deviation of the nipple; (2) retraction of the orifices upon the nipple of one or more of the affected ducts; (3) slight elevation of the nipple; (4) perhaps slight flattening of the nipple. When these signs appear, even though there may be no lump in the breast, the imminent onset of a cancer

should be feared. The appearance of white dots upon the nipple is significant. These dots are the ends of the cylinders of epithelial debris which fill the affected ducts, and may sometimes be squeezed out of them by digital pressure.

I am very hopeful that in cases where the danger signals I have mentioned are present the timely administration of a course of X rays of some penetrative power will avert the development of cancer. I saw recently a case in which three years previously I removed the right breast for a precancerous mastitis. The remaining breast now shows danger signals, though no tumour is present. I am sending her for X ray treatment and hope thus to avert the threatened onset of a carcinoma. I believe there is a large and hopeful field for the employment of X rays as a preventive of breast cancer in women with a family history of the disease, and in those presenting signs of chronic mastitis or duct catarrh.

Papillomata.

In duct papilloma of the breast I am unable to record success from X ray treatment. If, however, the papilloma can be localised removal of the breast can often be averted by the use of buried radium tubes. Multiple papilloma of the colon usually ends in carcinoma and no effective treatment is known. Is it not possible that it might be successfully attacked by X rays or by the swallowing of radon capsules?

THREE PERIODS OF X RAY THERAPY.

Looking back over the history of therapeutic X rays during the past 30 years three periods can be traced.

The *first period* of inadequate and tentative dosage, sometimes successful in destroying a primary growth, but rarely averting dissemination. X ray treatment of this first period in my opinion established its value as a prophylactic of recurrence, but to a limited extent only. In alliance with improved methods of operation it almost abolished local recurrence after breast operations, but it showed itself powerless to prevent the deeper parasternal deposits arising from the glands of the internal mammary chain. I have lately shown that in a large percentage of cases of breast cancer these glands are infected prior to operation.

The *second period* of X ray therapy was ushered in by the discovery of the Coolidge tube and the exploitation at Erlangen of the utmost power the tube could supply or the patient withstand. The high hopes which the method inspired have been shattered, and the words of caution uttered by leading British radiologists, and especially by Knox, have been fully justified. On at least three occasions I have seen fresh secondary nodules appear on an area which had been subjected within the previous three months to intensive X ray treatment. In the following case intensive X ray treatment seemed clearly to have stimulated a growth and perhaps to have aroused into activity a second primary growth.

Miss H. noticed a lump in the left breast in 1924. The breast was removed by her doctor. In January, 1928, an enlarged right axillary gland was felt. Intensive X ray therapy was begun and was continued for six months. The patient then ceased to attend, finding that her condition was getting worse. While she was under treatment the right breast became hard, and a rash appeared extensively over the chest. When I first saw her on July 31st, 1928, she had an ulcerated right nipple with a subjacent growth having the characters of a second primary growth. A recurrent lump was present just below the left axilla in the operation scar. An extensive nodular erythematous rash covered the front of the chest and extended into the left axilla. It had a definitely raised edge, and in the axilla its lower margin formed a right angle which appeared without any doubt to mark out the lower limit of an area of X ray exposure.

It is agreed by dermatologists that a right angle seen in a skin lesion marks it as "factitious" and this case comes under that rule.

The *third period* of X ray therapy dates from the recognition of the failure of Erlangen methods. The great power of the modern tube is now used in divided doses which do not produce vomiting or other undesirable constitutional symptoms. These methods are justifying themselves by a progressive increase in the power of X ray treatment to control and prevent recurrence. I note particularly that I have recently seen several cases where the advance of nodular deposits of breast cancer, widely spread over the chest and abdomen, has been arrested. Successes have also been recorded in the treatment of primary breast cancers by X rays alone, and I have myself seen such cases. But even after the disappearance of the primary growth the appearance of secondary foci may falsify the hopes first raised.

RADIUM.

The discovery of radium by the Curies, a characteristic triumph of French logic and perseverance, opened out new vistas in radiology. Radium rays proved themselves to be much more effective in quality than the X rays available at that time, and to a certain extent I believe this is still true. But the principal advance was this, that it became possible for the first time to introduce the focus of radiation within the body and thus to maximise the dose of radiation received by the diseased area and to minimise the dose received by the rest of the body. To secure this characteristic advantage of radium to the full a new branch of surgery has arisen which has received the name of radio-surgery, and except in growths on the surface the use of buried radium tubes, first introduced by Dominici, seems likely to supersede surface radium treatment.

Radio-Surgery.

In regard to radio-surgery the most interesting question of the moment is the proper therapeutic adjustment of two variables, the amount of radium buried, and the time it is left in. Shall a high intensity of radium radiation be used for a short time, say 24 hours, or a low intensity for a long time, say a week? At the Middlesex Hospital, partly because of the operation of a rota for the use of radium by different members of the staff, the large quantity short time method has been in use. In some forms of growth—for instance, in bone sarcomas and in the sternal deposits of breast cancer—it has given excellent results. In growths of the tongue Prof. C. Regaud's observations in Paris show that the prolonged low-intensity method is much the more effective.

The results obtained in cancer of the tongue at Westminster Hospital by Mr. Arthur Evans and others with even smaller amounts of radium are, I understand, very good. At St. Bartholomew's Hospital Mr. Geoffrey Keynes has used a prolonged low-intensity method as a substitute for operation in breast cancer, and with promising results. He has shown that it is possible, using only a moderate amount of radium, to deal effectively with a large area of tissue. Thus the prolonged low-intensity method, as compared with the short high-intensity method, would seem to have definitely proved its superiority in squamous carcinoma and in some glandular cancers. Sir C. Gordon Watson has made a systematic attempt to apply the prolonged low-intensity method to rectal cancer.

And here I must confess that at the Middlesex Hospital we have been in this respect slow to draw practical conclusions from the results of our own research laboratories. The time-quantity ratio for any given number of milligramme-hours was first shown to be of importance in treatment by Prof. Lazarus Barlow, and I believe that his results inspired to some extent the methods which Regaud has successfully adopted for cancer of the tongue at the Radium Institute in Paris. It was shown by Lazarus Barlow that cells in a state of active division are about seven times more sensitive to radiation than resting cells. The necessity of prolonging the radiation period so as to cover, if possible, the division of every cell of a malignant mass is thus indicated, and is insisted upon by Regaud. Lazarus, Barlow also compared the effects of quantitatively identical gamma-ray

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bombardment upon squamous and upon columnar epithelium, according as the quantity of radium was large and the time of exposure small, or the quantity of radium was small and the time of exposure large. For squamous epithelium the prolonged low-intensity treatment was the more effective. Clinical observations have confirmed these results for squamous carcinoma beyond the possibility of doubt.

Prophylactic Use of Radium.

It is now about seven years since I realised that the internal mammary glands which lie along the internal mammary artery just outside the edge of the sternum are infected by breast cancer at about the same time as the axillary glands. About seven cases out of ten have enlarged axillary glands when they first come for advice. Thus in 70 per cent. of cases, when it first comes into the surgeon's hands, breast cancer is an intrathoracic disease. Since I recognised this fact and met it by burying a line of radium tubes at the time of operation along the line of the internal mammary glands, the percentage of my cases free from recurrence at the end of three years has gone up from 47 to 56.

The Stimulating Effect of Small Doses.

I now approach a subject of great difficulty, and one which appears to require increased attention from radiologists. I refer to the possibility, which from my clinical experience appears almost a certainty, that very small doses of radiation may exert a stimulating effect upon the cells of a malignant growth, and may thus do harm instead of good. The suggestion is that if a radium tube is placed for a certain time in a field of tissue already impregnated with isolated and latent carcinoma cells, the field will differentiate itself into three zones: (1) a central circle or zone where carcinoma cells are destroyed; (2) an inner zone where the carcinoma cells, though not killed, are inhibited; (3) an outer zone where the carcinoma cells are stimulated to more rapid growth. Abbé, experimenting with bean embryos, found that a minimal dose of radium stimulated growth, while increasing doses progressively retarded and finally arrested the growth of the embryo. Lazarus Barlow, working with ascaris ova, obtained similar results. These observations establish a primâ facie case for small dose stimulation of malignant cells by radiation, a phrase for which in the rest of this lecture I shall use for short the word "stimulation."

In my earlier work with buried radium tubes, now dating back nearly 15 years, it was my custom to implant the tubes in the centre of or beneath the palpable or visible nodule of malignant tissue. The usual result was the shrinkage or disappearance of the malignant focus. But within a few months the hopes thus raised were shattered by the appearance of fresh malignant nodules in the region immediately around. It seemed likely that this unsatisfactory result was due to the stimulation, by an inadequate dose of radiation, of an inappreciable and apparently healthy zone of microscopic invasion around the visible focus of disease. To meet this danger I adopted, and have since used, the plan of encircling the palpable focus of disease by a ring of radium tubes in order to sterilise the zone of microscopic infection.

In connexion with this question I now wish to draw attention to a case of recurrent breast cancer which presented two nodules close to each other, one above and one below the outer part of the scar (Fig. 1). On March 31st, 1928, a 25 mg. tube of radium bromide was buried just above the upper nodule and a similar tube just below the lower nodule for 24 hours. At this time these nodules were the only recurrent manifestations anywhere near the scar, but on April 8th a suspicion of nodular thickening was felt at a point four inches internal to the original nodules, and the same distance from the radium tubes. By May 2nd a line of definite nodules was present along the scar, the nearest nodule 2 in. from the focus of radiation, the furthest 4½ in. from it. The smallest nodules were the nearest one and the most remote one, the largest, was 4 in. from the focus. The nodules originally treated were reduced to fibrotic relics. A second tracing was made on May 18th. A new tiny nodule had now appeared 1 in. only from the focus. The other nodules had continued to grow, the original one being still the largest. By May 25th three new nodules had appeared, one of them 1¾ in. away from the focus, the other two 2½ in. away from it. Of the two remotest nodules, 4½ in. away, one had disappeared and the other was smaller.

If we assume that numerous quiescent depôts of cancer cells were present all along the scar at the

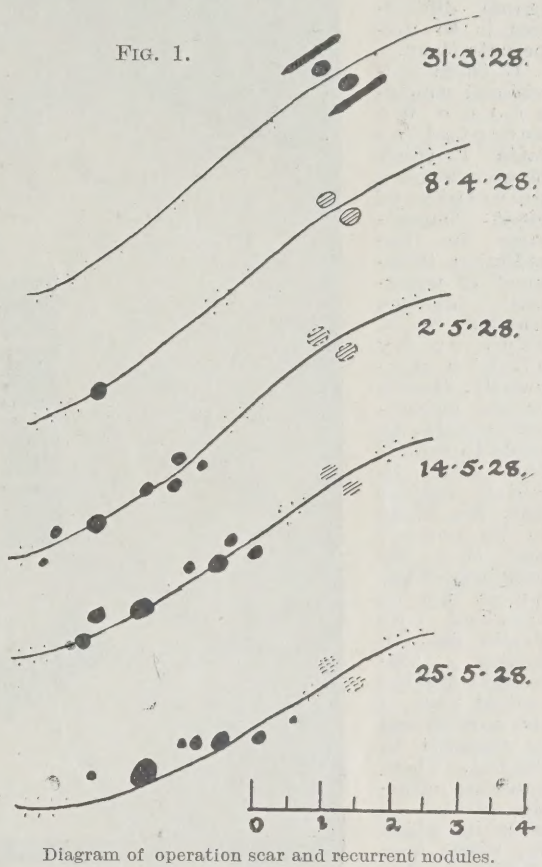

Diagram of operation scar and recurrent nodules.

time the radiation was given—a very reasonable hypothesis—and further assume that the subsequent developments were due to the action of the radium, we arrive at the following data. Two radium tubes each of 12·5 mg. shielded by 1 mm. of platinum and acting for 24 hours, give destruction or prolonged inhibition of cancer cells within a radius of about an inch. At a distance of 4 in. from the focus there is a maximal active stimulation of cancer cells, manifesting itself within eight days. After 32 days stimulation effects had shown themselves over a zone covering points situated between 2 in. and 4½ in. from the focus, but with a focus of maximum stimulation 4 in. from the focus. After 48 days stimulation, or mere failure of inhibition, was manifested at points as near as within one inch of the focus, while at the periphery of the field 4½ in. from the focus there was a suggestion that the stimulated nodules were again receding—i.e., that very weak doses of radiation have only a temporary stimulating effect.

This case standing alone has only a suggestive value, though I could produce others in support of it. If a long incision into the subcutaneous tissue were made in an animal, and if carcinoma cells were planted along the incision in a line, as potatoes are planted in a trench, the application of a radium focus at one end

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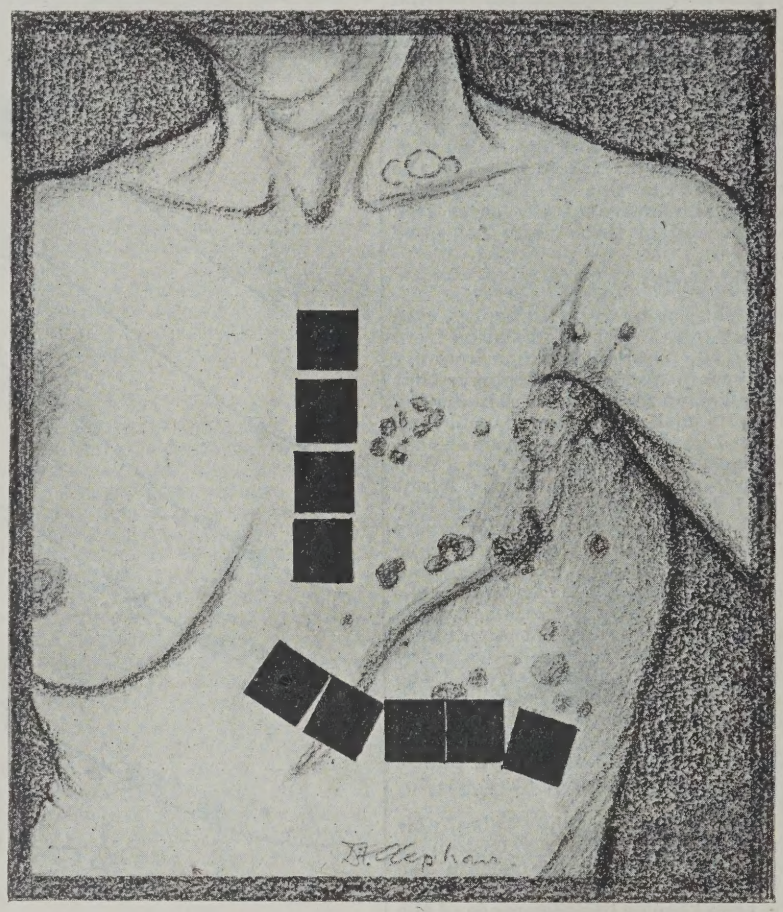
of the incision should give information as to the stimulating or depressing effects of radiation expressible in exact mathematical terms. There has, I think, been a tendency to ignore the possible stimulating action of small doses of radiation, partly because of the absence of exact data with regard to it, partly because of the fear of exciting prejudice against a novel method of treatment. But the position of radiation in the treatment of malignant disease is now so unassailable that the second objection no longer holds. In any case to ignore difficulties is to perpetuate them.

If these provisional conclusions be accepted as facts I think there emerges a principle of great importance in the radiation treatment of malignant disease, whether by X rays or by radium—namely, that a careful endeavour should be made to delimit the area in which cancer cells are likely to be present, and that the periphery of the area thus marked out should first be treated. The treatment of the central part of the area should be reserved to the last. These remarks naturally refer to cases in which the whole area affected is too large to be treated at one sitting.

FIG. 2.



Radium barrage. 20 mg. capsule.

Take, for instance, a case of primary carcinoma of the breast. A circle of 10 or 12 in. with the growth as its centre may require to be irradiated. In my judgment the whole periphery of this circle should be treated before the palpable primary growth is submitted to the rays. The opposite, and, I believe, the usual practice is to irradiate the primary lump first and most, and so incur the risk of delivering a small stimulating dose to its microscopic extensions and driving them further afield. I make these suggestions with more confidence because in the field of radio-surgery I have tested this encirclement method and have found it to produce a great improvement in results. It deals effectively with the zone of microscopic infiltration and permeation. If, on the contrary, a central method of treatment is adopted this zone is stimulated to increased activity, and though the primary growth may disappear its dissemination is actually hastened.

In regard to diagnosis I wonder if radiologists take every opportunity open to them to verify their findings. Do they sufficiently study the pathology of the living (the phrase is from Sir Berkeley Moynihan's mint) as revealed in the operating theatre in cases which they have previously submitted to X ray examination? In connexion with this question I feel certain that the radiologist might with advantage oftener visit the wards and the operating theatre and the surgeon more frequently be found in the X ray room. Conference between colleagues is much better than the exchange of reports. Now that diagnosis and therapeutic radiology are both of them such large subjects it is worth considering whether the art of radiology would be advanced by a more complete separation between these two branches of practice.

THE STUDY OF RADIO-HISTOLOGY.

Surgery, like therapeutic radiology, is an art combating local disease by local measures, and there are some who believe that technique and manipulative skill are the sole necessary qualifications of the surgeon. This view has never held sway in England, for the founder of the English school of surgery, John Hunter, was an experimental pathologist who combined in himself the functions of the researcher and the surgeon. The Hunterian museum of the Royal College of Surgeons of England, a collection without rival in the world, is a standing witness to the belief of English surgeons that pathology is the real basis of successful surgery, and that technique is by comparison but its necessary handmaid.

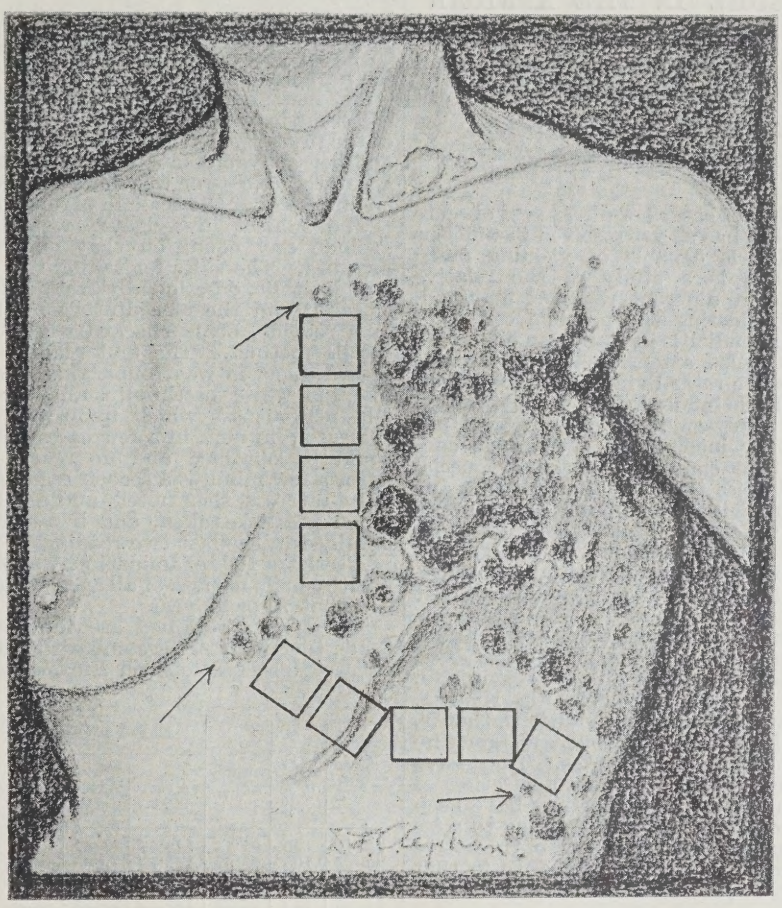
Now it appears to me that just as surgery may be led astray by the exclusive, I will not say the undue, exaltation of technique, so, too, may radiology. An intimate knowledge of the pathology of the conditions with which he deals is just as necessary for the radiologist as for the surgeon. Probably more than half the therapeutic work of radiologists is concerned with cancer. I feel certain that a closer personal study by radiologists in their earlier years of the way in which cancer spreads would increase the efficiency and success of its radiological treatment. This is all the more necessary if, as seems likely to happen in the near future, radiation largely replaces the knife in the treatment of cancer.

Radiologists, like surgeons, must attack their own special pathological problems, for the pathologist, with his illimitable field of research, generally considers pathological histology an exhausted area and is too busy to enter it. May I here suggest that the

universities of Cambridge and Liverpool, which have given such powerful aid to radiology by the institution of a diploma in the subject, and more recently by creating lectureships, should reconsider their syllabus so as to direct the attention of candidates more closely to those parts of pathology which bear upon radiology.

Correct and precise ideas on the mode of spread of cancer are vital to a therapeutic radiologist, and I may be allowed here to refer to my own work on the dissemination of breast cancer by permeation, which not only placed operative treatment upon a rational basis but has indicated also someconditions of successful radiological treatment. In a paper read in 1919 before the Electro-Therapeutic Section of the Royal Society of Medicine I tried to show how at that time some X ray treatment was vitiated by undue restriction and bad centring of the field of radiation, by exclusive attention to the lumps which could be seen and felt without regard to the microscopical extensions of the disease, and sometimes actually by failure to undress the patient and examine the tumour before its treatment was begun. This incursion of a surgeon outside his own territory was taken in the friendly spirit which inspired it.

FIG. 3.



Showing permeation round edges of barrage.

To illustrate what I mean I shall now draw attention to a few pathological observations which bear directly on the radiology of breast cancer. 1. In what appears to be the healthy region round a cancerous deposit there is probably a zone of microscopic infiltration, and outside this again a region of permeation, where the lymphatic vessels are choked by cancer cells. 2. Breast cancer invades the abdomen frequently by direct infiltration in the epigastric angle. 3. The glands along the internal mammary artery, which lie within the thoracic cavity, are invaded at about the same time as the axillary glands. 4. The plane in which external cancers spread is the plane of the deep fascia, because in that layer the main lymphatic plexus lies. Such cancers do not spread in the plane of the skin. 5. Tuberculous lupus, like cancer, is an invasion of the lymphatic system. It is not a skin disease but a lymphatic disease. The moral of these observations is too plain to need pointing. I may, however, remark that to cure either lupus or cancer an effective dose of radiation must not merely impinge upon the skin, but must be carried down at least to the plane of the deep fascia.

In order to illustrate the importance of correct pathological ideas in the field of practice, may I now describe an experiment which, with the patient's full consent, I carried out upon a case of recurrent breast cancer where numerous secondary nodules were spread over an area of the thoracic wall. In such cases X ray treatment directed to the visible and palpable nodules causes them to disappear, but the disease continues to spread and fresh nodules appear at the periphery. The reason, of course, is that beyond the remotest nodule there is a peripheral zone, lying in apparently healthy tissue, where the microscopic growing edge of the disease is spreading by permeation in the fascial lymphatic plexus. With the coöperation of Prof. Russ and of my registrar, Mr. Muir, a line of radium capsules, broken in the middle by an intentional gap, was laid down in the presumed situation of the microscopic growing edge over skin which appeared quite healthy and a maximal skin dose was administered. *No treatment was applied to any recognisable focus of disease.* Opposite the radium barrage the nodules ceased to spread, while they continued in the subsequent months to advance through the gap left in the radium barrage, and round its ends. Radiation had destroyed or inhibited the microscopic growing edge (Figs. 2 and 3). This experiment, which I have repeated since, is surely a proof that to see a cancer as it really is one must close the eyes and use the imagination (Figs. 1 and 2).

I venture to suggest that young radiologists should be encouraged to study the pathological side of radiology for themselves first by the establishment of a museum, in charge of a histologist whose opinion would in the course of years become of decisive value in radio-histological questions, and secondly by the establishment of one or more research scholarships in radio-histology. Now that the technical equipment of therapeutic radiology has reached such a high degree of power and accuracy, I am convinced that the nation which first places the subject upon a complete pathological foundation will lead the way to fresh triumphs. Now that radiology has come of age and

can control its powerful weapons, its future depends upon a closer study, from its own particular angle, of the diseases it has to fight, and of the tissue changes produced by radiation.

In conclusion, may I be allowed to express my personal thanks for help received to Dr. Douglas Webster and his staff at the Middlesex Hospital, and to many other radiologists from whom I have had friendly help and counsel.

BLOOD PRESSURE IN THE AFRICAN NATIVE.

ITS BEARING UPON THE ÆTIOLOGY OF HYPERPIESIA AND ARTERIO-SCLEROSIS.

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In the investigation of causes of diseases of obscure ætiology, a factor that has as yet received insufficient attention, but which is capable of yielding much information of value, is a study of the relative incidence of disease in different races of mankind. For instance, in considering the possible causes of the prevalence of appendicitis in European countries, many writers have called attention to the rareness of this disease in native races living under conditions that have been but little influenced by the civilisation of white races.[1] The same statement has, not infrequently, but very incorrectly, been made concerning cancer. These comparisons are of special interest in those diseases that are alleged to be due to modes of living in civilised communities. A group of such diseases which occupies much attention nowadays are the allied conditions of hyperpiesia, arterio-sclerosis, and chronic interstitial nephritis, and it is to a consideration of these conditions that this paper is devoted.

The investigations recorded here were all carried out on natives living in one of the largest of the native reserves in Kenya Colony—namely, South Kavirondo, situated on the shores of Lake Victoria Nyanza. These natives live under primitive conditions, that is, under conditions which have probably undergone no appreciable change for many centuries. They have been but slightly influenced by the colonisation of Kenya, the main influences to which they have been subjected, government and missions, tending to raise the standard of the present mode of living of the native rather than to introduce any radical change in that mode.

Normal Blood Pressure in the African Native.

A consideration of the incidence of hyperpiesis amongst African natives entails, first of all, consideration of the normal blood pressure. Our knowledge of normal blood pressure at present rests upon figures chiefly gained from large numbers of records collected mainly in America.[2] It would be unwise to assume that the normal for an American citizen anxious to insure his life should also be the normal for an African native. Consequently a series of investigations upon apparently healthy natives was carried out. It is necessary, first of all, to place on record the conditions under which these investigations were made and the methods adopted.

The observations were carried out on the four main tribes occupying the South Kavirondo district—the Wakisii, Luo, Abakuria, and Abasuba. Men only were investigated. Recruits for labour in various parts of Kenya are examined in large numbers at Kisii Hospital, and these provided a large number of healthy young subjects for investigation. Older men were not so easy to procure at Kisii, but these were more readily obtained whilst on tour in the native reserves when the older men gathered together in council. It should be pointed out that the investigations at Kisii were carried out at an altitude of about 5700 feet, and, on tour, in country varying in altitude between 3500 and 5000 feet. It seems unlikely that such altitudes could have any marked influence upon the blood pressure of inhabitants.[3] Determination of the age of the natives was not easy. Natives rarely have any idea of their own ages, consequently their ages had usually to be estimated. No claim is made for strict accuracy with regard to the ages shown in the following table, but it can at least be claimed that they were grouped fairly correctly in relative age groups. It seems that it is uncommon for natives to reach what is called old age in the European. Occasionally natives were seen who seemed perhaps 70 to 80 years of age, but they were only met with infrequently. Consequently all natives judged to be 60 years of age or over were grouped together for purposes of calculation.

The instrument used was an aneroid sphygmomanometer made by Messrs. Down Bros. At the conclusion of the investigation the instrument was tested against another sphygmomanometer that was known to be accurate. No error was detected greater than 2 mm. on the parts of the scale in regular use.

The subject investigated was first examined to exclude any condition that might influence blood pressure. The rules for taking the readings, systolic and diastolic, described by Halls Dally, were followed closely,[4] and the auscultatory method was adopted as a routine, being checked where necessary by the tactile method. The first reading was always disregarded, as it was found that the African native, like his white brethren, suffers from apprehension and nervousness which frequently affect his blood pressure; in fact, in a few cases no constant reading could be obtained and no record could be made. After a few minutes a second reading was taken. The pulse-rate was then noted, and a third reading of the blood pressure taken, and if a constant figure was obtained in the last two readings a record was made.

A series of 1000 examinations was made in apparently healthy male natives of all ages, ranging from 15 years to about 70 or 80 years.

The results obtained are shown in the following table, with figures, for comparison, derived from large series of observations on Europeans and Americans.

Age group.	Cases examined.	Aver. pulse-rate.	Blood pressure.			Normal in Europeans and Americans.[2]		
			Aver. syst.	Aver. diast.	Aver. diff.	Syst.	Diast.	Diff.
15–19	99	68·71	123·07	81·89	41·18	123	80	43
20–24	100	63·22	122·76	79·99	42·77	125	81	44
25–29	100	63·57	126·37	83·96	42·41	126	82	44
30–34	115	64·55	126·05	84·73	41·31	127	83	44
35–39	100	69·46	125·55	85·86	39·69	128	84	44
40–44	93	68·52	118·32	81·29	37·03	129	85	44
45–49	96	69·17	113·19	75·50	37·69	131	86	45
50–54	100	72·20	109·79	74·09	35·70	133	87	46
55–59	100	70·73	106·59	69·63	36·96	135	88	47
60 and over	97	75·23	105·76	66·98	38·78	140+	90+	50+

Syst. = systolic; diast. = diastolic; diff. = differential.

It will be noted that the figures differ distinctly in the two races. Up to the fourth decade the figures for the two races agree approximately. After that the blood pressure, both systolic and diastolic, tends to come down in the African, whereas in the white races it continues its tendency to rise until the eighth decade.

Incidence of Hyperpiesia, Arterial Degeneration, and Chronic Nephritis.

The highest systolic blood pressure recorded during the course of the above investigation in a subject showing no pathological condition and no detectable signs of nervousness was 172 mm. This was observed to persist for about two hours, but unfortunately the case could not be followed up. Another case was found to be 150 mm., and this was observed to persist for two days. In nervous subjects it was not

uncommon to find a systolic blood pressure of over 200 mm. temporarily. It was very uncommon, however, to meet with a systolic blood pressure that persisted for long above 144 mm. Over two years at a native hospital, during which period approximately 1800 patients were admitted, afforded good opportunity for recognition of pathological conditions that might have arisen in the native population as a result of high blood pressure, arterial degeneration, and chronic nephritis, and where any suspected case was admitted blood pressure was recorded. No case of raised blood pressure was encountered, though abnormally low blood pressure was not uncommonly noted. On no occasion was a diagnosis of arterio-sclerosis or chronic interstitial nephritis made. One case was encountered that gave a history suggestive of angina pectoris, but no abnormality was detected on examination, and the blood pressure was 105/74. Occasionally cases of hemiplegia are seen amongst natives, but such as I have had the opportunity of examining have occurred in young men, have presented no cardiovascular abnormality, and circumstances have suggested that relapsing fever may have been the cause. Aortic incompetence has been occasionally recognised, but these cases have either occurred in young natives or have probably been of syphilitic origin. Hypertrophied hearts, without intrinsic cardiac disease to account for the enlargement, are very rarely met with in the African. Cases are sometimes met with in which the apex beat is displaced to the left, but after investigation of a number of these cases I arrived at the conclusion that the heart was displaced and not enlarged. There was no evidence of any myocardial inefficiency, and the blood pressure was invariably within normal limits.[5] Opportunities for carrying out post-mortem examinations have often occurred, and it has been noted that the native African usually shows much less atheroma in the aorta than does an average European of the same age. In a man of 30 frequently no signs of atheroma can be seen, and a man of 50 will often show slight traces only.

The results of this investigation thus lend support to the view that hyperpiesia and arterio-sclerosis are diseases associated with civilisation. Hyperpiesis has been recorded as quite common in Egypt by Ismail,[6] but this is a country that has been considerably influenced by European and other civilisations, recent and remote. Furthermore, Ismail points out that the disease is almost confined to middle, upper, and more educated classes, and is rare amongst hospital patients. It is of interest to record here that senile calcification of the aorta has been noted in the mummy of Meneptah (reputed Pharaoh of Egypt), and is to be seen in the museum of the Royal College of Surgeons.

Ætiology of Hyperpiesia.

Two main views of the causation of high blood pressure at present are described—namely, (1) the toxæmic theory, and (2) the view that the condition arises as the result of an over-responsive vaso-motor system, which has been described as the mental stress theory. Two sources of toxin have been stressed as possible causes of hyperpiesia and arterio-sclerosis—viz., (1) a focus of chronic infection, (2) derivatives of protein digestion. It is difficult to suggest forms of chronic infection that are common in Europeans and that are rare in the African native. Pyorrhœa is very common in natives under 30 years of age, and almost universal above that age. Tonsillitis is common, and nasal sinus infection is sometimes seen. Chronic ulcers of the leg are very common amongst them, and constitutional toxic effects due to them are frequently seen. Constipation is just as prevalent, I believe, as in England. Other conditions that are stated to be toxæmic in origin are common, as chronic arthritis and rheumatoid conditions. Meat is frequently consumed by the races in South Kavirondo, though possibly not to the extent that it is consumed in England. In this connexion some observations upon blood pressure in the Masai tribe, who feed largely on milk and ox blood, would be of interest.

The other view, of which one of the leading protagonists is Lord Dawson, is briefly that hyperpiesis is the result of a "high pressure existence" or of mental stress. I think almost everybody who has been closely associated with the African native will agree that he very rarely can be described as living a high pressure existence. McDowall[7] has suggested that the physiological rise in blood pressure that occurs as a result of mental stress is to provide for the increased muscular activity that should naturally follow occasions that create mental stress, but that under civilised conditions mental stress often fails to be followed by its physiological safety valve of muscular action. This view certainly receives support from the rarity of high blood pressure in the African native.

Comparison of Normal Blood Pressure in European and African Races.

Further allusion must be made to the differences between the normal blood pressures for the two races. Under the age of 40 years the figures for both systolic and diastolic blood pressures are very similar for the two races. Above that age the blood pressure for the European rises steadily up to the age of 80, after which it falls. The average blood pressure at 60 years of age is 140 systolic and 90 diastolic in the European, whereas in the African it is 105 and 67 respectively. The contrast is somewhat striking, and seems to require explanation. In both races there are, of course, fairly wide variations compatible with health, and figures of value can only be obtained by taking averages of large numbers. Systolic blood pressures of below 100 mm. are common in the African, and 110 were noted in the above observations. No less than seven cases were encountered of systolic blood pressures below 80 mm. in natives who appeared to be quite healthy. These natives were all considered to be 55 years of age or over.

Individual variations compatible with health are noted to occur in response to physical and psychical changes. Similarly, prolongation of, or constant repetition of, such stimuli has been suggested as being responsible for pathological changes. To apply these analogies to the racial variations it may be possible to evolve a hypothesis to account for such racial differences. The native African, or at least the type who lives in the native reserves, amongst whom these investigations were carried out, has probably for a large number of generations lived in a manner that has undergone but very slight change. The European and American populations have, on the other hand, seen revolutionary changes in their mode of living in a very few generations as a result of the industrial revolution of the nineteenth century, the increased facilities for travel and communication, the growth of large cities, and the increasing complexity of warfare. That such developments have had their effect upon the diseases of the race is undoubted. I suggest that such differences in the evolution of the two races could be held responsible for the differences in their normal standards of blood pressure; in other words, that the greater mental stress required by the ordinary European citizen in his everyday life, as a result of the tendencies of modern civilisation, has had its effect upon the physiology as well as the pathology of the race.

My thanks are due to Dr. J. L. Gilks, Director of Medical and Sanitary Services, Kenya Colony, for permission to publish this paper.

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RADIUM THERAPY OF CANCER OF THE BUCCAL CAVITY.*

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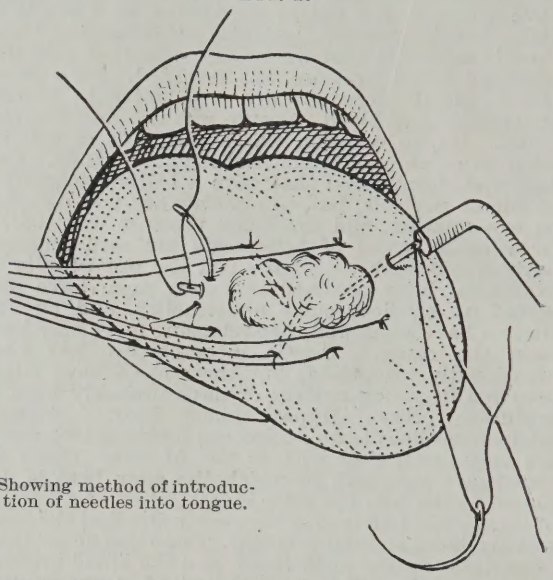
(With Coloured Plate.)

It is now established that primary cancer of the tongue can be made to disappear by means of radium in a large proportion of cases. Quick [1] in America, Regaud [2] in France, Ledoux [3] in Brussels have used this method of treatment well over five years, and the time is not far distant when statistics based on a minimum period of five years survival will be available in this country. The best results are obtained in early and operable cases—in these the disappearance of the growth depends upon a correct technique. In inoperable cases good results are obtained locally, although the problem of the extraoral extension of disease is still bristling with difficulties. Hopelessly advanced cases, so frequently sent for radium therapy, are beyond the stage where any form of treatment is of value, and to expect "cures" in this group of patients is at present to expect miracles. Radium treatment does not always result in a complete disappearance of the growth, and occasionally a local recurrence is seen two or three years after irradiation. In my experience a second treatment is possible and sometimes gives excellent results. Harmer [4] advocates diathermy excision of the scar left after irradiation. Radium treatment in careful hands often transforms an inoperable case into one suitable for operation.

Pathological Considerations.—The treatment of oral neoplasms by means of radium depends on the selective action of the gamma rays upon the newly developed cells. From the earliest days of radium therapy it was recognised that cells in mitosis were more sensitive to irradiation than cells at rest. But the success or failure of treatment does not depend solely upon the response of the cell to irradiation. It has been shown that the effect of irradiation on the stroma is equally important. Roussy [5] has shown that a good result may be expected in those cases where the disappearance of mitosis and cellular disintegration is unaccompanied by changes in the stroma. Personal observations on biopsies in cases of lingual cancer fully support Roussy's observations, and prognosis is bad in cases where the tissues are œdematous or scarred by previous fibrosis, due to so-called "precancerous changes."

Fig. 1.



Showing method of introduction of needles into tongue.

Whatever the mechanism of the action of radium on the growth, the effects of irradiation are partly dependent on the blood and lymph supply of the tissues, and the state of circulation in the irradiated part influences materially the results obtained from gamma ray therapy.

The tongue and oral cavity offer a field eminently suitable for close observation of the effects of irradiation on the growth, as the changes can be inspected daily. From continuous clinical observations in a series of 50 cases it is seen that between irradiation and the appearance of the changes a period of time elapses which varies with various factors. This "latent" period is of clinical importance, as both malignant cells and normal tissues, although apparently not affected at the end of treatment, are profoundly and permanently affected, the outward change not becoming apparent for a variable period of time.

There are four types of neoplasms commonly seen in the mouth: (1) the papillary, (2) the nodular, (3) the ulcerous, (4) the fissured. The degree of malignancy of these groups when considered from the point of view of "excisional" surgery is in the order mentioned. From the point of view of radium therapy the prognosis is reversed, and the papillary type, which is the most malignant, responds most rapidly to irradiation. The more rapidly the tumour grows the more sensitive it is to the effect of gamma rays. The sensitivity of tumours to irradiation can be increased by artificial means which are at present being investigated.

Anatomical Considerations.—Whatever the situation of the neoplasm its response to irradiation is the same. The results are better in the anterior group owing to the simplicity of technique in this situation. The posterior part of the tongue presents difficulties in approach and the extent of the lesion is easily underestimated. Growths of the inferior aspect of the tongue and floor of the mouth extend early beyond the intrinsic muscles of the tongue; they involve the alveolar margins and bone. This renders

Fig. 2.

Skiagram of mouth showing 14 platinum seeds in the posterior part of the tongue.

* Based on a paper read at the International Conference on Cancer, London, July, 1928.

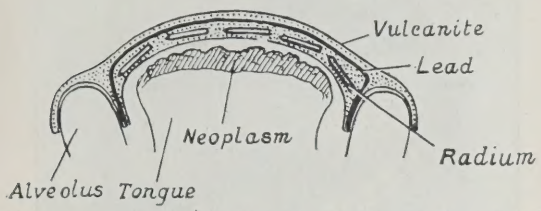
treatment difficult. Early lesions in the floor of the mouth give good results.

Methods of Irradiation.

The technique of irradiation varies with the anatomical site of the disease. Three methods of irradiation are used in the treatment of cancer of the buccal cavity.

1. *Interstitial Irradiation.*—This method consists in the introduction of radium salt or radon emanation

FIG. 3.

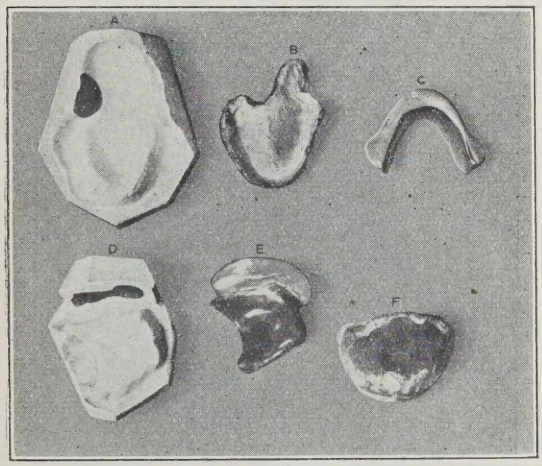


Method of surface application showing vulcanite apparatus containing radium. A lead lining protects the roof of the mouth and lower jaw.

screened by platinum into and around the tumour. It is most suitable for growths of small size and easily accessible to manipulation. The use of platinum needles is the method of choice in the treatment of lesions of the tongue and floor of the mouth. For tumours of small volume it is sufficient to surround the lesion with needles; if the lesion is extensive it is necessary to introduce the needles into the tumour as well. The advantages of this method in selected cases are (1) the possibility of calculating the dose carefully and accurately, (2) homogeneous irradiation, (3) prolongation of period of treatment, since normal tissues are protected by the multiplicity of foci and maximum screenage.

2. *Cavitary Method.*—This method is suitable for the treatment of cancer of the palate, uvula, certain

FIG. 4.



Showing method of making plates for the application of radium to the palate and buccal mucosa. A, plaster-cast of palate; the black area outlines the growth. B, lead-lined vulcanite plate made from A. C, protection plate for lower jaw. D, plaster-cast of floor and side of mouth; the black area outlines the growth. E, plate made from D, carrying small box for irradiation. F, model made of stent, roofed with lead for surface application to tongue.

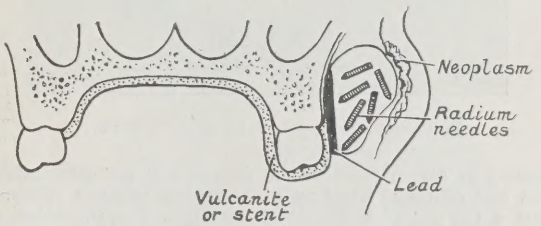
types of epitheliomata of the cheek and lip. A plate similar to a denture is used. This appliance is made for each individual case. It is made of vulcanite, stent, or composition, lined with lead, and carries the requisite amount of radium. The application may be continuous or interrupted, and is prolonged till the desired reaction is obtained. The palate and buccal aspect of the cheek are the only situations where this method is used in preference to interstitial irradiation.

3. *Surface Application.*—By surface application is meant the application of radium at a short distance from the skin. The distance at which the radium is placed varies with individual schools. At Westminster Hospital 15 mm. is the standard distance. The substance employed is known as Columbia paste.[6] Collars are made so as to cover the whole or part of the neck. This method is used for the treatment of secondary cervical deposits. The details of the preparation of the paste collars have been published elsewhere.[7]

Treatment.

The treatment of oral cancer is carried out in two or three stages. It consists in the treatment of the primary lesion by means of radium followed two or three weeks later by the treatment (surgical, radiological, or combined) of the lymphatic area. The reasons for adopting this method, which clinically give satisfactory results, are based upon the necessity of preserving the best possible blood and lymphatic

FIG. 5.



Vulcanite apparatus carrying small box containing the radium for carcinoma of cheek. Lead protection to maxilla. Apparatus to be worn two weeks or more.

supply to the area treated. The disappearance of the tumour is hampered by the removal of lymphatics and ligation of blood-vessels, which, of course, is the object of the operation on the neck. This step therefore should be left till the primary growth has been successfully dealt with.

Primary Growth: Technique.

Tongue.—Before introducing radium it is necessary to carry out a scrupulous toilet of the mouth. Carious teeth are extracted, metal fillings removed, tartar scraped, and sepsis eliminated as much as possible. The introduction of radium needles is carried out under local or general anæsthesia according to the temperamental suitability of the patient for one or the other method; for lesions on the postero-dorsal aspect of the tongue, intratracheal anæsthesia through a nasal catheter is the method of choice. The growth is carefully examined and needles are introduced around it into healthy tissue at a minimum distance of 1 cm. from each other. The needles must be completely buried in the substance of the tongue, the linen thread only protruding at the surface, as otherwise small areas of necrosis occur around the protruding eye of the needle. The threads are passed through the substance of the tongue, tied at one end and cut short (Fig. 1). The long ends are collected into a rubber tube and attached to the skin of the cheek by means of strapping. The protection of the rest of the mouth, specially the palate and the alveoli, is obtained by means of dental plates lined with lead. When dealing with a neoplasm situated far back on the posterior aspect of the tongue, the introduction of needles may present serious technical difficulties. In this position platinum radon seeds are of great advantage (Fig. 2). Seeds are easily and quickly introduced and need not be sutured in. They can be placed and kept in position in situations inaccessible to needles. When platinum seeds are used in the mouth, no protection of the bony arches is required. But from the point of view of uniform intensity of

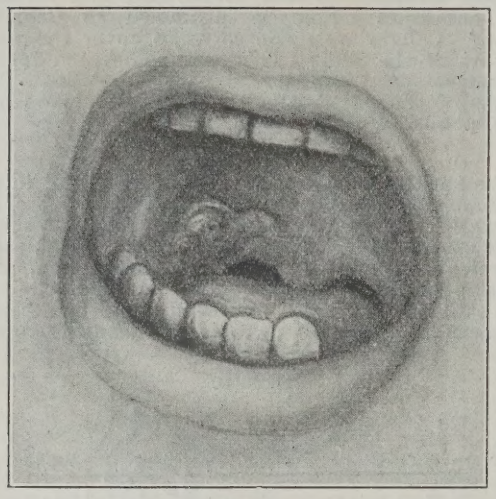
irradiation needles are superior to seeds. In cases where most of the tongue is involved by the disease and it is difficult to keep the needles in the tissues for the desired period of time, surface application by means of an intrabuccal apparatus is an alternative but less efficient method of applying radium (Figs. 3 and 4 (E)). The duration of surface application is 14 days.

Dosage.—Needles containing 0·6 mg. and 1·33 mg. of radium screened with 0·5 and 0·6 mm. of platinum are used. Their number varies with the extent of the growth. As a rule eight to ten needles are required. They are left in position seven to nine days. The total dose varies from 800 to 1600 mg. hours.

Pillars of Fauces and Uvula.—The method of choice is irradiation by means of radon seeds. The seeds are introduced by means of a trocar and cannula [8] round and behind the growth. Regular distribution is aimed at, the seeds being placed at a distance of 1 cm. from each other. The seeds have an initial strength of 1·8 or 1·2 millicurie each. Eight or ten seeds are necessary according to the extent of the lesion. They are left in position 10 to 14 days. The patient is examined every second day and the seeds removed when there is evidence of reaction manifested by redness and slight œdema. Hospitalisation is not essential, and the majority of cases can be treated as out-patients at this stage. If seeds are not available, small needles 9 mm. long containing 0·5 mg. of radium, screened by 0·5 mm. of platinum, are used; they must be securely sutured in position and this is facilitated by the use of cleft-palate needles. Protection of the hard palate and lower jaw is necessary owing to the continuous maximum intensity during the whole period of treatment. The needles are left in position seven days. The total dose is 1000 mg. hours.

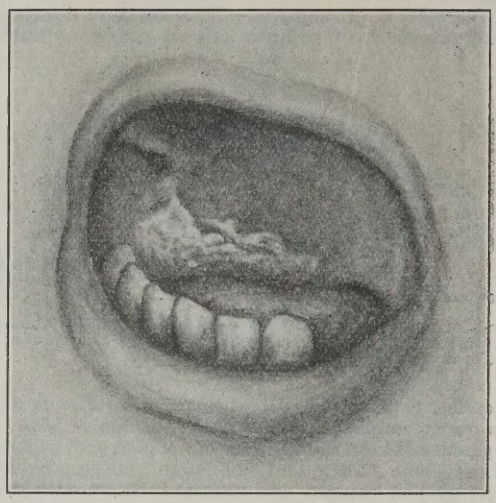
Palate.—Intrabuccal surface application is the method of choice and is suitable for all cases except those involving the free border of the palate and uvula. A plaster cast of the roof of the mouth and the lesion is taken (Fig. 4 (A)). A vulcanite or stent apparatus is made and lined inside with 1·5 mm. of lead (Fig. 4 (B)); a window corresponding accurately to the extent of the lesion is cut in the upper surface of the plate; needles containing 2, 1·3, and 0·6 mg. of radium are placed

FIG. 10.



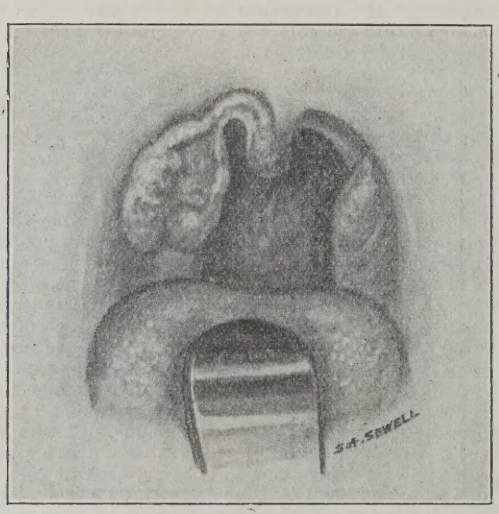
Epithelioma of palate: before treatment.

FIG. 11.



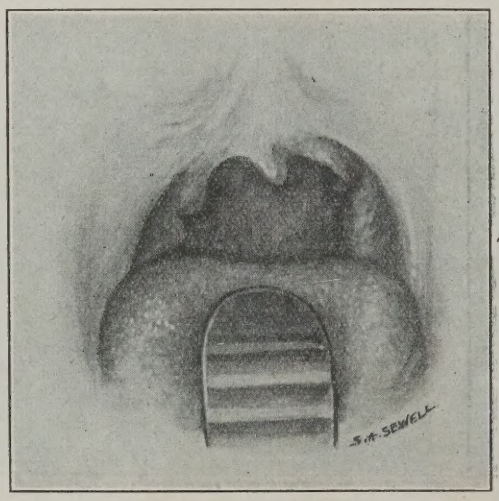
The same case as Fig. 10 showing a radium burn.

FIG. 14.



Epithelioma of the palate and tonsil (diagnosis confirmed by biopsy).

FIG. 15.



The same case as Fig. 14 five weeks after radium treatment (total dose, 705 mg. hours).

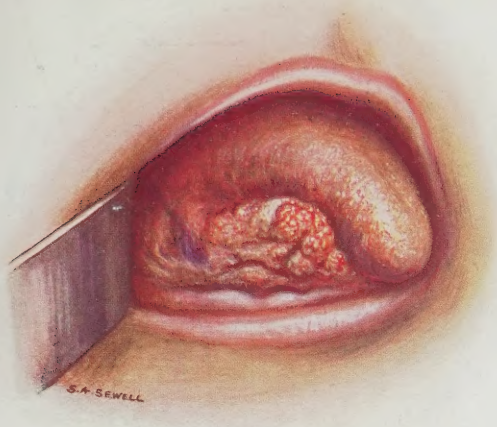


FIG. 6.—Epithelioma of tongue and floor of mouth before treatment.

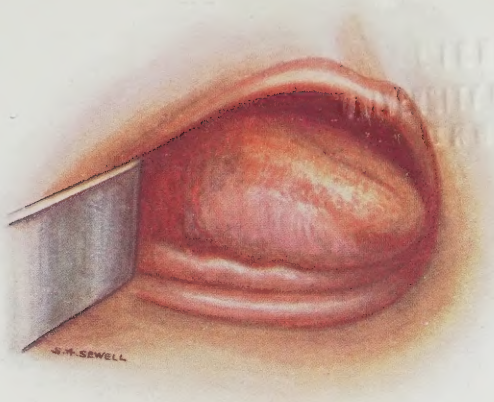


FIG. 7.—The same six weeks after radium treatment.

FIG. 8.—Epithelioma of tip of tongue with well-marked leucoplakia.

FIG. 9.—The same six weeks after treatment. The epitheliomatous ulcer is healed. The leucoplakia remains.

FIG. 12.—Epithelioma of the left side of tongue (diagnosis confirmed by biopsy). Wassermann reaction positive.

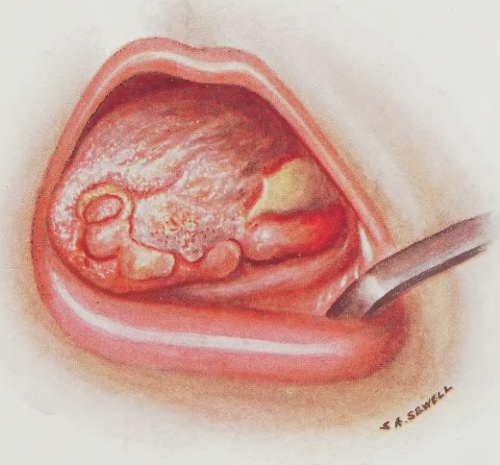


FIG. 13.—The same three weeks after treatment.

FIG. 1.

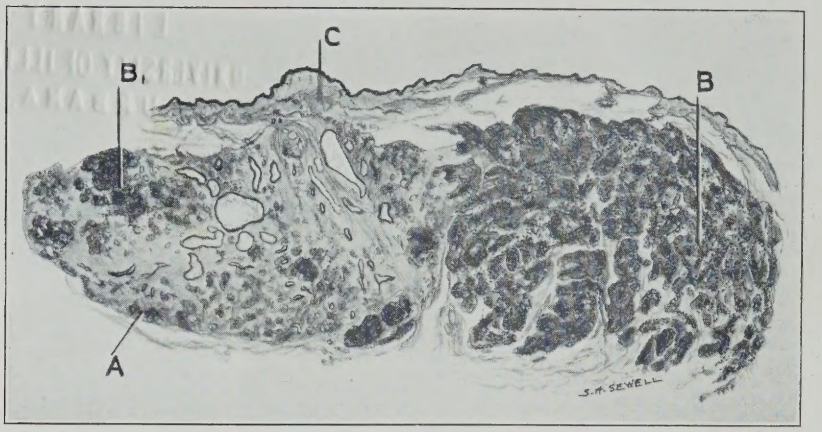


FIG. 2.

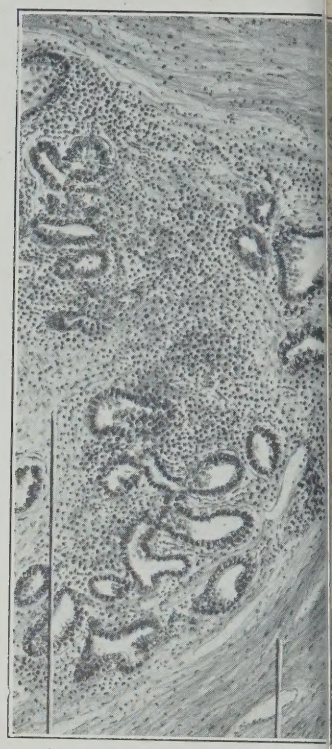


FIG. 4.

FIG. 8.

FIG. 5.

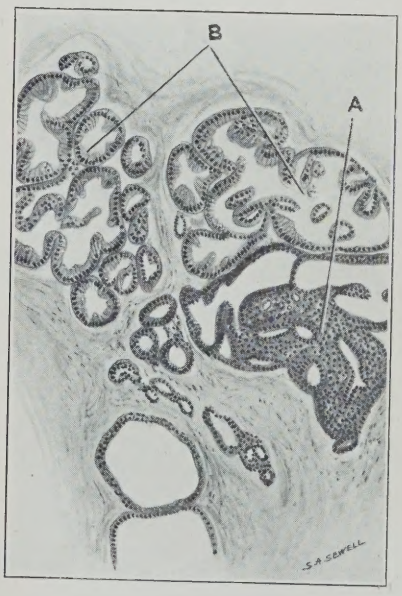


FIG. 7.

Descriptions of the illustrations will be found in the text of the article.

on the plate and covered with vulcanite; 15 mg. of radium are required. The plate is worn day and night for 10 to 14 days. It is removed daily and a mouth wash given. At the end of five days the needles are rearranged so as to obtain a more uniform irradiation. The results are satisfactory and extensive carcinomata involving nearly the whole palate have been made to disappear.

Buccal Mucosa.—Epithelioma of the cheek responds well to radium treatment. The extent of the growth is the main factor in the choice of the technique adopted. Surface application from inside the mouth or externally may be used as an alternative to needling in this situation and by this method there is less risk of perforation of the cheek and a more even distribution of radium is obtained. Needling with very small needles or seeds gives very good results. For a localised growth not involving the muscles of the face, a stent or shellac shield is made to fit either the lower or upper jaw whichever is most suitable for the individual case. A plate is attached to the apparatus so as to keep in contact with the neoplasm. The plate consists of a layer of lead 1·5 mm. thick, covered with stent, the radium is placed on the stent (Fig. 4 (D, E) and Fig. 5). The apparatus contains 10 mg. of radium and is worn for seven to ten days. Total dose: 2000–3000 mg. hours. If the growth has invaded the muscular layer of the cheek and there is difficulty in opening the mouth, external application by means of columbia paste is resorted to. The dosage in this case is increased to 5000 mg. hours.

Cervical Lymphatic Glands.

Operable Cases.—One month after irradiation of the primary growth, operative removal of the glands on the side of the lesion is carried out. The operation must be extensive and aim at the eradication of all the glands, deep fascia, sterno-mastoid muscle, and internal jugular vein—following Crile's technique. The removal of the sterno-mastoid simplifies the operation and gives a much better exposure of the glandular area. The removal of the internal jugular vein with all adjacent glands should be carried out from just above the clavicle up to the base of the skull or as near to it as practicable. All the glands removed must be individually examined histologically, and only in the absence of any deposits is no further treatment indicated. If one gland shows a secondary deposit, the neck must be irradiated.

Irradiation.—Three weeks after operation, when the wound is soundly healed, a Columbia paste collar 15 mm. thick is made. It covers both sides of the neck. An average of 70 mg. of radium is necessary. It is best to use needles of 1·3 or 2 mg. each. The operated side receives one third and the non-operated side two-thirds of the total quantity of radium. The average period of treatment is two weeks; the treatment is intermittent, the patient receiving 16 hours daily. The total dose is 10,000 mg. hours. This figure represents the dose emitted by the apparatus, and not the dose received by the patient. Erythema and superficial desquamation are the objective signs of sufficient dosage.

Inoperable Cases.—In cases where the mass of glands is fixed and involves the cellular tissues of the neck, complete surgical removal is impossible and radium therapy presents the only possible means of alleviating the patient. No case, however extensive the glandular involvement, should be left untreated. Bilateral irradiation is inadvisable in this group of cases. The reaction aimed at is severe and consists in complete peeling of the skin. It is important to irradiate the mass very slowly, and at least three weeks treatment is advised. The amount of radium varies with the size of the mass to be destroyed; 20–23 hours daily are given. The total dose amounts to 25,000–30,000 mg. hours. By this method good palliative results are obtained in cases where no other form of treatment is possible. As to permanency of these results, all that can be said at present is that patients have remained well up till two years after treatment, and when it is noted that these patients had large masses of glands and were inoperable, the results are encouraging.

It may be argued that if such results are obtained in inoperable cases, why not adopt this method in early cases and dispense with operation altogether? In the present stage of radium therapy the results are not sufficiently constant to justify this, and although palliation of symptoms and prolongation of life are obtained in inoperable cases, a combination of surgery and irradiation is still the best policy in operable cases.

Illustrative Cases.

The following five cases have been selected to illustrate the immediate results of radium treatment of cancer of the oral cavity. Case 3, one of the earliest cases treated, shows the result of bad technique, terminating in a radium burn. I am indebted to Dr. Braxton Hicks for all the histological and serological investigations in connexion with these cases, and to Mr. A. H. Clarkson for all the prosthetic work.

1. Mr. W. J., aged 50. Extensive carcinoma of the papillary type on the right side of the tongue and floor of mouth (see Coloured Plate, Fig. 6). There was a large mass of glands in the submental and submaxillary triangles. Biopsy: squamous-celled carcinoma. Treatment: 6 mg. of radium in 10 needles introduced around the growth and left in position seven days. Total dose: 1080 mg. hours. The primary lesion healed entirely (Coloured Plate, Fig. 7). Although the

SIR LENTHAL CHEATLE: LEGENDS TO ILLUSTRATIONS. (*See Plate opposite.*)

FIG. 1.—Whole section (natural size) of breast of woman, aged 32 years, who died in the seventh month of pregnancy. C = Nipple. B and B_1 = Active (genetic) growth of acini. A = Less active part from which Fig. 2 was drawn.

FIG. 2.—Section A from A, Fig. 1. Terminal ducts and acini in a lobule. The epithelium is in a state similar to that seen in mazoplasia. The pericanalicular and periacinous connective tissue has undergone hyperplasia. Among its fibres are seen many lymphocytes (compare with Fig. 3). B is the normal supporting connective tissue of the breast in which the lobule is embedded.

FIG. 4.—Section of breast. Terminal duct A_1 and A and its acini B, B_1. The duct ends and the acini begin about A where the elastica (unstained in this specimen) ends. The drawing represents a pure state of cystophorous hyperplasia. The shed colostrum-like cells in the transverse section of the duct A can be seen arising in all stages of formation from the epithelial hyperplasia within the wall of this duct. A collection of acini at B has become confluent and has formed an early cyst. Lining B_1 and B is the desquamative epithelial hyperplasia which is so typical of this state. In parts there is (unlike the hyperplasia in the duct) here and there a formation of small papillomata which are supported by delicate fibrillous stalks of connective tissue.

FIG. 5.—Section showing cystophorous hyperplasia in the groups of acini B where early cystic formation has begun. In the terminal duct A the epithelial hyperplasia is dysgenetic and strictly confined within distended but normal boundaries encircling the duct. There is a slight hyperplasia elastica which is not stained in this specimen. It is impossible to say how long the epithelial hyperplasia in the terminal duct will remain in its present state. It would be interesting to see this microscopical field at the end of about two years. There was no carcinoma of this gland. There were other parts of the same duct in which similar fields could be discovered.

FIG. 7.—A drawing of a part of a duct wall A from which has arisen a dysgenetic epithelial hyperplasia partly consisting of a papillomatous formation and partly sessile. B is placed in the lumen of the duct. The epithelial hyperplasia is still confined within distended but normal boundaries. The whole of a duct and its branches—of which this specimen is one—contained a similar dysgenetic epithelial hyperplasia. At one part epithelial cells had invaded outside structures and an early state of carcinoma existed. It was accidentally discovered in one of the whole sections that was cut and examined of this breast. There was no carcinoma in the lymphatic glands in the axilla which was cleared and examined microscopically.

FIG. 8.—Represents the two terminal branches A of a duct which has just divided (×30). The elastica is shown in this specimen and it has undergone enormous hyperplasia which also surrounds a few of the acini into which these two branches lead B and B_1. Dysgenetic epithelial hyperplasia of sessile type has taken place in the ducts and acini. Some of the epithelial cells have escaped into the surrounding connective tissue C and carcinoma therefore exists. Microscopical sections of the axillary lymphatic glands failed to reveal carcinoma.

glands were inoperable, a portion of the mass was removed, and a Columbia paste collar carrying 70 mg. of radium in 32 foci applied 18 hours daily for 18 days. Total dose: 22,600 mg. hours. The mass disappeared; there was extensive peeling of the skin of the neck. The patient died of cerebral hæmorrhage seven months after treatment; there was no local recurrence.

2. Mr. A. B., aged 56. Epithelioma of the tip of the tongue; on palpation a tumour the size of a walnut was felt in the anterior half of the tongue. The superficial ulcer involved the frenum; there was marked leucoplakia of the whole tongue (Coloured Plate, Fig. 8). Wassermann reaction: negative. Biopsy: squamous-celled carcinoma. Treatment: 8 mg. of radium in 8 needles introduced around and into the growth, and left in position seven days. Total dose: 1280 mg. hours. The tumour in the tongue disappeared; the ulcer healed. The leucoplakia was not affected (Coloured Plate, Fig. 9).

3. Mr. A. F., aged 60. Epithelioma of the palate. Early case suitable for radium treatment. The condition before treatment is shown in Fig. 10. An error of technique was committed and this had disastrous consequences. The needles used contained 5 mg. of radium each; the screenage was only 0·5 mm. of platinum. At present the needles employed for this type of lesion contain ten times less radium—viz., 0·5 mg.—and have the same protection. The total dose given was double the maximum dose: 4200 mg. hours. A radium burn resulted; the condition six weeks after treatment is shown in Fig. 11. The white slough took five months to separate, the adjacent portion of the palate was red and œdematous, the mouth was dry, there was intense pain. The patient died of exhaustion seven months after treatment.

4. Mr. H. H., aged 46. Very extensive ulcer on the left side and dorsum of the tongue (Coloured Plate, Fig. 12). No enlarged glands palpable in the neck. Biopsy: squamous-celled carcinoma. Wassermann reaction positive. Treatment: 6·6 mg. of radium in 11 needles inserted around growth and left in position seven days. Total dose: 1100 mg. hours. The condition three weeks after treatment is shown in Fig. 13 (Coloured Plate).

5. Mr. G. B., aged 53. Epithelioma of pillar of fauces, involving tonsil and extending to free edge of palate and uvula (Fig. 14). Enlarged glands on both sides of the neck. Biopsy: squamous-celled carcinoma. Treatment: 4·2 mg. of radium in seven needles introduced around and behind the lesion and left in position seven days. Total dose: 705 mg. hours. Complete cicatrisation of the lesion followed. The condition 5 weeks after treatment is shown in Fig. 15. A crile dissection was performed. This was followed by a radium collar.

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ROYAL NORTHERN HOSPITAL.—The recent anonymous gift of £35,000 for the building of a pay-bed block of 60 beds was conditional upon a similar sum being contributed by the public to the general needs of the hospital by the end of the year. This sum has now been successfully raised.

WEST SURREY HOSPITAL LEAGUE.—This organisation, which was formed recently to manage the contributory scheme in connexion with the Royal Surrey County Hospital, has already achieved considerable success. There are between 13,000 and 14,000 contributors, and it is believed that a total of 40,000 can be reached.

DIET AND PEPTIC ULCERS IN CAVIES.

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THE ætiology of peptic ulcers in man is still obscure, and any experiments which throw light on it are therefore desirable. The experiments reported in this paper were drawn up not only with this object in view, but also to study the effect of deficient diets on the rhythmical movements of the surviving intestine. The results, therefore, fell into two categories, pathological and physiological. The former alone are dealt with in this paper; the latter will appear in another journal.

Experiments.

The experiments were done on cavies which were three-quarters grown when they began. For the physiological work it was necessary to kill off from day to day the animals which showed well-marked signs of malnutrition. This could not have altered the pathological findings to any appreciable extent.

Preliminary Experiment.—In a preliminary experiment 15 cavies were divided into five groups of three each and fed as follows:—

1. Cereals with grass and turnips—control diet.
2. Cereals—deficient in inorganic elements, especially calcium, chlorine, and sodium.
3. Cereals + minerals—inorganic composition adjusted so as to be similar to that of No. 1 ration in so far as analyses were available.
4. Cereals + minerals—bases as in No. 3, but acid radicles (Cl, PO_4, and SO_4) in excess relative to No. 1.
5. Cereals + minerals—bases as in Nos. 3 and 4, but acid radicles as in No. 2, i.e., low acid-base ratio.

Rations 2 to 5 were also low in vitamins, especially A and D. They were undoubtedly deficient, because all the animals fed on them went downhill very rapidly, especially those in Groups 2 and 4. No. 4 ration was the most unsuitable; two of the animals died seven and ten days respectively after being placed on experiment. The other was killed on the seventh day. No. 5 ration was evidently the most suitable, because the two animals that died naturally lived much longer than any of the other experimental animals—viz., 22 and 24 days respectively.

Post Mortem.—Group 1: No abnormality seen. 2: Congestion on gastric and duodenal side of pyloric sphincter in three, and of the cæcum in the region of the ileo-cæcal valve in two. 3: In three, congestion with hæmorrhages into the mucosa round the ileo-cæcal valve. 4: Large liver abscess in one, pneumonia in two. 5: In three congestion in the region of the pyloric and ileo-cæcal sphincters, and in one of these a well-marked intussusception of the jejunum. This was very probably not agonal, because the animal was killed intentionally.

Sections were made of affected portions of the pyloric region, the adrenals, and other tissues. Out of five cases examined microscopically, two showed hæmorrhages and three others excessive vacuolation of the cortex of the adrenal. The congestion in the pyloric region involved chiefly the loose tissue on both sides of the muscularis mucosæ, but often the muscle tissue was involved. In places the epithelium of the villi or glands was degenerated and there was evidence of hæmorrhage into the lumen. Congestion was found in the thyroid, kidney, pituitary, and pancreas.

The pyloric lesions were very slight in Group 2, and in Group 4 the lesions found post mortem (pneumonia in two and liver abscess in one) were most probably secondary to the malnutrition established by the diet. These results are interesting in view of the fact that ration No. 4 was clearly the most unsuitable, while ration No. 2 came next. They suggested that a higher incidence of local lesions would be obtained by employing diets with a slight, rather than a marked, deficiency. In subsequent experiments, therefore, we attempted to postpone a fatal issue for as long as possible by incorporating small amounts of green food in the diets of some groups.

Expts. 1, 2, and 3.—Three other experiments were done. The diets are shown in Table I. The animals in Group 1 in each of the three experiments were controls; their diets were adequate because they all grew normally and remained healthy. The animals in Groups 2 and 3 in each of the three experiments deteriorated from the start, and after a variable time developed signs of malnutrition. All the animals were given as much of their particular ration as they cared to eat, except that in Group 2, Expts. 1 and 2, green stuff was given in the amounts stated to each animal per day. No. 2 rations were all poor in calcium, sodium, and chlorine, and also in vitamins A and D. No. 3 ration was relatively poor in potassium and in vitamins A, C, and D. All the experimental rations were rich in phosphorus.

TABLE I.

Group.	Expt. 1.	Expt. 2.	Expt. 3.
1	Barley + turnip.	Barley + grass.	Barley + turnip.
2	Barley + turnip, 2 g.	Barley + grass, 0·5 g.	Barley 95 parts + turnip 1 part.
3	Barley 25 parts + salt mixture 1 part.	Same as in Expt. 1.	—

In view of the changes in the adrenals a number of unilateral-adrenalectomised cavies was included in all groups in Experiments 2 and 3. The left gland was removed in every case, because of the great operative difficulties in removing the right. Contrary to Sharpey-Schafer's statement (1924, p. 100) we were convinced that the deaths of the very few animals that succumbed could be attributed to some complication, avoidable or accidental, during the operation and not to removal of the gland per se. Autopsies were done on all animals, generally within an hour after death, whether natural or not, except on those that died during the night when several hours elapsed before examination was made. Sections were made of affected parts of the stomach and duodenum, the adrenals, and the thyroid.

Results.

In none of the non-operated control animals was any significant organic change observed. Sections of tissues from 15 of these were examined. The findings in the other groups are summarised in Table II.

TABLE II.

Expt.	Group.	No. of cavies.	Congestion, hæmorrhage in mucosa of pyloric region.	Ulcer or erosion in mucosa of pyloric region.	Congestion, hæmorrhages or ulcers of cæcum or colon.	Congestion, hæmorrhage in adrenals.*	Excessive vacuolation of adrenals.*
1	2	10 N	5	1	5	8	2
	3	10 N.	10	2	3	8	2
2	2	5 N.	4	0	0	1	3
	2	5 Op.	5	0	0	3	2
	3	5 N.	5	3	3	2	3
	3	4 Op.	2	1	1	3	0
3	2	2 N.	2	1	1	2	2
	2	6 Op.	5	3	0	2	3
	Total ..	32 N.	26	7	12	21	12
		15 Op.	12	4	1	8	5
	Percentages	N.	81	22	37	66	37
		Op.	80	27	7	53	33

N = Non-operated. Op. = operated.

* In only six cases did circulatory disturbances occur along with abnormal vacuolation (three in Expt. 2 "N.," two in Expt. 3., "N.," and one in Expt. III., "Op.")

Operated Controls.—In the control groups there were eight unilateral adrenalectomised animals. Three of these showed congestion and hæmorrhage and three others excessive vacuolation of the adrenal cortex. Three of these six had numerous ecchymoses in the gastric mucosa, which were obviously not due to injury of the viscus during operation.

Experimental Animals: Alimentary Canal.—The congestive changes in the pyloric region were as described under the preliminary experiment. The erosions varied very much in degree. In one case an ulcer of the hepatic aspect of the duodenum had perforated, but the resulting abscess was localised. In the remainder the appearances varied from cases where only the surface epithelium was destroyed to others where only one layer of infiltrated muscle separated the lumen from the peritoneum. The superficial lesions were extensive and evidently acute; congestion, hæmorrhages, and degeneration of mucous membrane were their predominating features. The deeper lesions were more localised, but less congested than the superficial. Discrete ulcers with cellular infiltration of the surrounding tissues were the most conspicuous appearances in the subacute lesions, which were generally found only in the most long-lived animals. The ulcers varied in size from a speck, just visible, to a more or less circular area about 5 mm. in diameter. The edges were sloping and not punched out. In several cases, whether erosions or ulcers were present or not, the gastric and duodenal mucous membrane was unhealthy looking and peeled off very readily.

Without exception, animals that had lesions of the stomach or duodenum showed evidence of stasis in the cæcum and proximal colon, whether or not inflammation was present in these places. In some cases the cæcum was overloaded and atonic-looking, in others it was markedly sacculated. In both types the distal colon was generally contracted and cord-like, often containing bloody fæcal matter and casts. Variable amounts of foul-smelling gas were often present in cæcum and colon. Constipation was the rule in the late stages, but diarrhœa was frequent in the early stages, especially in Group 3.

Adrenals.—The changes in the adrenals were like those observed by McCarrison (1921, p. 170) except that the hæmorrhages were not confined to the periphery of the cortex, but occurred all over it, sometimes bordering on the medulla. The increased vacuolation was not confined to any particular zone, although in individual cases one zone was often more affected than others. Very often the entire cortex was involved. In normal animals vacuolation, when at all conspicuous, was confined for the most part to the zona glomerulosa. One may reasonably assume, in agreement with Cramer (1926), that the hyperæmia was evidence of increased activity of the gland and the hæmorrhage of excessive activity. The significance of the abnormal vacuolation was not so clear, and our procedure did not throw any direct light upon its nature—whether it was genuine and due to degenerative changes, or apparent and due to accumulation of lipoid which had been dissolved out by the balsam in which the sections were mounted (Cramer, 1918). This author regards the presence of cortical lipoid as a sign of functional activity and its absence as a sign of inhibition or exhaustion of the cortex, which, he suggests, is concerned in the secretion of adrenalin. The excessive vacuolation in our experiments appeared to be merely an exaggeration of the normal, and the regular outlines suggested vesicles full of non-staining material rather than degenerative changes. We are inclined to think, therefore, that the vacuolation was a sign of great activity, a view which is supported by the results in our own adrenalectomised controls and by the observation of Bast, Supernaw, and others (1928). They have recently found increased vacuolation of the cortex in rabbits subjected to prolonged nervous and physical stimulation. It is, therefore, probable that the conditions observed in the adrenals were indications of great or excessive functional activity.

Thyroid.—In the thyroid the only abnormal condition we could be sure about was hyperæmia of very varying degrees. In some cases the vesicles were small with scanty colloid and cubical epithelium (signs of activity); in others the vesicles were large and full of colloid and the epithelium was flattened (signs of diminished function). These conditions were probably not related to the deficient diets, because thyroids from normal animals showed much the same appearances. Changes in the histology of the thyroid have,

however, been observed as a result of deficient diets—Sharpey-Schafer (1924); Harris and Smith (1928); Murray (1923).

Discussion.

The disordered rhythm (as found in our physiological experiments), the alimentary stasis, the lesions in stomach, duodenum, and large bowel, and the changes in the adrenal are apparently all interrelated and caused either proximately or remotely by the deficient diets. A priori one would expect dysfunction of the bowel movements to be primary to the organic lesions. The fact that irregular rhythm was obtained in some cases showing little or no visible organic change strengthens this belief. The disorganised movements would presumably lead to stasis followed by putrefactive changes evoking abnormal sensory stimuli. These, in accordance with Carlson's opinion (1916), would induce pylorospasm, and in consequence hyperæmia of the parts and delayed emptying of the stomach. The signs and symptoms referable to the alimentary canal, observed in completely adrenalectomised animals by Biedl, Elliott, Vincent, and others, and more recently by Rogoff and Stewart, Swingle, and his colleagues, and others, point to a definite connexion between the function of the adrenals and of the alimentary canal. Rogoff and Stewart (1926, *a*) almost invariably found circulatory disturbances in the alimentary canal post mortem and often erosions or ulcers in the stomach or duodenum. They found the highest incidence of ulcers (7 out of 17 dogs) in adrenalectomised pregnant females, whose survival period was always many times longer than that of males or non-pregnant females. Rogoff and Stewart (1926, *b*), Banting and Gairns (1926) have also found similar ulcers in adrenalectomised dogs. Furthermore, Hartman (1924) has cited experiments by Weiskotten, who found hyperæmia and hæmorrhage of the adrenal cortex in patients dying from superficial burns. In such cases, as is well known, peptic ulcers of an acute type are common.

Cramer (1926) has suggested that products derived from intestinal putrefaction cause stimulation of the adrenals, an opinion which leads to consideration of the action of protein decomposition products—e.g., histamine on the adrenals. We are not aware of any experiments bearing directly on this point, but it has been shown by Dale (1920) and confirmed by Banting and Gairns (1926) and by Crivellari (1927) that the resistance of completely adrenalectomised animals to histamine is abnormally low. Dale has pointed out that a close similarity exists between the condition of the blood in adrenalectomised animals (lowered plasma content) and animals that have received large doses of histamine. The increased concentration of the cellular and of other constituents of the blood after adrenalectomy has been confirmed by Rogoff and Stewart (1926, *c*), Swingle (1926), and Hartman et al. (1927). The evidence, therefore, strongly suggests that the function of the adrenals is to antagonise the action of histamine and probably of similarly constituted substances. Furthermore, it is interesting to note that McIlroy (1928) has recently produced peptic ulcers in cats by large injections of histamine with and without previous local experimental trauma. These considerations have led us to think that excessive intestinal putrefaction is causally related to spasm of the pylorus and to adrenal exhaustion, and that the latter, as well as the former, is a factor in the production of circulatory disturbances in the stomach and duodenum. If acute these conditions apparently cause death without any marked degenerative change; if subacute they apparently cause ulceration of a chronic type. Ulcers in the pyloric region or congestive or degenerative changes have been observed by Rowlands (1927), and by Underhill and Mendel (1927) as well as by McCarrison, as a result of diets deficient in various vitamins. It would seem, therefore, that deficiency of vitamins was the factor of greatest importance in the production of the lesions found in these experiments. The deficient diets used by us, however, were badly balanced in regard to several important inorganic constituents as well as being poor in vitamins. It is fairly certain also that many of McCarrison's diets, which induced organic changes in the pyloric region in cavies and monkeys, were poor in inorganic elements. It is therefore unwise to attribute the lesions observed by us to one or other of these factors only.

As these experiments proceeded we became more and more convinced of our inability to interpret the significance of many of the results obtained, especially those of a physiological nature. We therefore felt it desirable to postpone work on the effects of inadequate diets until our knowledge of the fundamental characteristics of smooth muscle was sufficiently far advanced to permit of more precise inferences. The experiments published here are therefore somewhat incomplete, but it is hoped that they will throw some light on the problem they were planned to elucidate. We fully realise, however, that derangements of other functions or of other tissues, not considered in this paper, probably also contribute towards the production of peptic ulcers.

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SEVERE ANÆMIA OF PREGNANCY AND THE PUERPERIUM.

WITH A REPORT OF TWO CASES.

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INVESTIGATION of the records of 1913 labours conducted at Queen Charlotte's Maternity Hospital in 1926 and of 2170 labours in 1927 failed to disclose a single case of severe anæmia of pregnancy and the puerperium. Reference to the literature also proves that the disease is uncommon. These facts alone render unnecessary any apology for placing the present cases on record.

The condition was first described in 1842 by Channing,[1] an American obstetrician, who distinguished it from anæmia resulting from hæmorrhage. He reported ten cases, all terminating fatally. Osler [2] classified the severe anæmias of pregnancy and the puerperium under four headings: (1) anæmia from post-partum hæmorrhage, (2) the severe anæmia of pregnancy, (3) post-partum anæmia, and (4) the acute anæmia of post-partum sepsis. He considered the anæmia in groups (2) and (3) to be the result of hæmolytic agents produced in the changed metabolism of pregnancy or in the katabolism of the post-partum state. Rowland,[3] reporting two cases in America, assumed that a syncytial hæmolysin is produced in the ectodermal cells of the chorion during pregnancy, and that later an antihæmolysin is found in the maternal blood; failure in the formation of this substance results in persistent anæmia. Smith [4] in America recorded eight cases. He considered adminis-

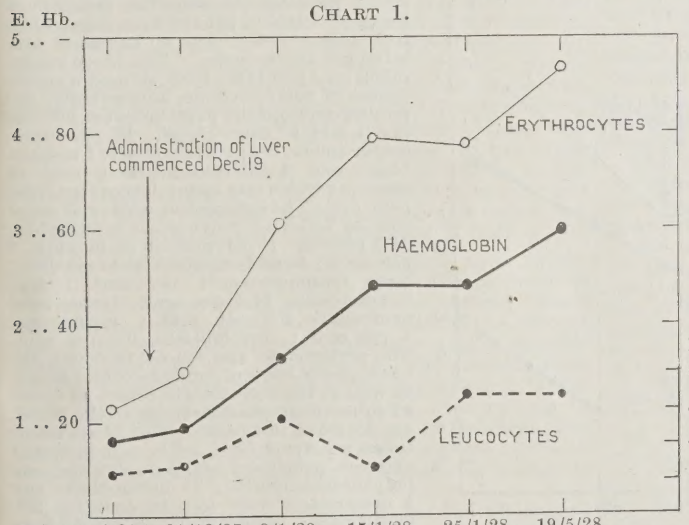
tration of dilute hydrochloric acid to be of distinct value in the treatment, and its deficiency to be a probable ætiological factor. In 1925 Larrabee,[5] of Boston, cited 17 cases. The blood picture in eight resembled that found in pernicious anæmia, in seven it simulated a secondary anæmia, in one it was atypical, and in another the condition resembled aplastic anæmia. He suggested achlorhydria as the main ætiological factor. Hoskin and Ceiriog-Cadle [6] reported a case which closely simulated Addisonian anæmia. They regarded as predisposing factors achlorhydria and general debility before pregnancy. Neale [7] in this country reported two cases in 1927. In one of them sepsis of the cervix uteri was present. Murdock,[8] in a paper recording two cases, pointed out that little or nothing was known of the ætiology of the disease. McSwiney [9] in India studied the condition in 43 patients. He found that it occurred in 1·69 per cent. of all pregnancies and is much commoner in early than in late pregnancies. The maternal mortality was 35 per cent. and the fœtal mortality 56 per cent. Multiple pregnancy, which occurred in three cases, he considered to be amongst the predisposing causes. The Wassermann reaction proved to be positive in eight cases out of 20—i.e., 40 per cent. Balfour,[10] reporting 150 cases investigated at the Bombay Clinic, found the disease more prevalent amongst Mohammedan than Hindu women. The illness usually commenced between the sixth and seventh month of pregnancy and was ushered in by fever, with or without diarrhœa. Enlargement of the spleen was detected clinically in 18 per cent. of cases. Albuminuria was common.

The Two Cases Described.

CASE 1, aged 29, was admitted to the London Hospital on Dec. 15th, 1927, under the care of Dr. Theodore Thompson.

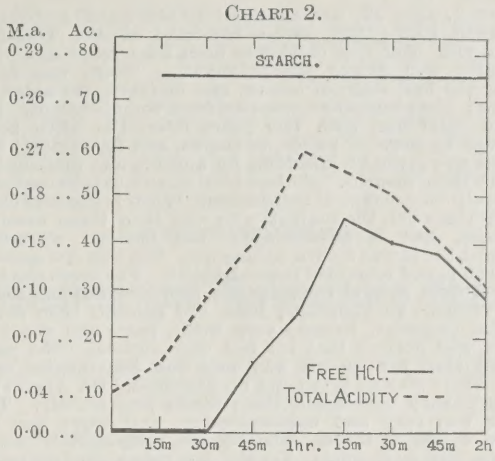
History.—The birth of her first child eight years previously occasioned no trouble. She remained well during the second pregnancy, which resulted in the birth of a full-term baby weighing 8½ lb. There was no excessive bleeding and no laceration of the perineum. The first child was then 15 months old. Immediately after delivery she complained of pallor, shortness of breath, great weakness, and swelling of the feet. She gradually got better. Three years ago, during the latter half of her third pregnancy, she complained of extreme and increasing pallor, great weakness, and shortness of breath. There was no fever nor diarrhœa. and the feet were only slightly swollen. The labour was uncomplicated, a full-term child was born, and the patient again gradually improved. During the second month of her fourth pregnancy she complained of weakness, shortness of breath, swelling of the feet and legs, palpitation, and increasing pallor; her friends remarked that she was "yellow." There was never any fever, diarrhœa, or vomiting. The symptoms progressed until the eighth month, when the onset of premature labour terminated the pregnancy. There was no excessive bleeding and the perineum remained intact. The symptoms persisted and she applied for admission to hospital one month after confinement. All four children were said to be healthy and thriving.

CHART 1.



Indicating progress in Case 1, as shown by successive blood counts.
E. = Erythrocytes per c.mm. in millions.
Hb. = Percentage value of hæmoglobin.
L. = Leucocytes per c.mm. in thousands.

CHART 2.



Record of gastric acidity values in Case 2, as determined by analysis of the fractional test-meal.
M.a. = Percentage of mineral acid calculated as HCl.
Ac. = Acidity of 100 c.cm. in terms of c.cm. N/10 HCl.

On examination the patient, a moderately well-nourished woman, appeared very weak, tired, and hardly able to move. She was extremely pallid, the skin being a deep buff colour. The mucous membranes were pale but jaundice was absent. There was no dental sepsis; the tongue was slightly furred. Temperature ranged from 97° to 99° F., and the pulse was of normal rate and rhythm. The blood pressure was 125/80. A hæmic murmur was heard in the pulmonary area. Examination of the lungs and central nervous system disclosed no abnormality. Retinoscopy proved the fundi oculi to be normal. The spleen was easily felt during deep inspiration; the liver was not enlarged. There was gross œdema of the feet and legs. The pelvic organs were normal and there was no vaginal discharge. A trace of albumin was found in the urine, but at subsequent examinations it was clear. There was no evidence of hæmorrhoids. The Wassermann reaction in the blood-serum was negative. The Ewald test-meal demonstrated absence of free hydrochloric acid, the total acidity value being 8. The fractional test-meal also demonstrated achlorhydria throughout. There was no abnormal fragility of the red blood corpuscles. Van den Bergh's test gave a negative direct reaction; the indirect reaction was weakly positive, showing presence of 0·7 mg. of bilirubin per 100 c.cm., equivalent to 1·4 units. There was slight excess of urobilinogen in the urine. The blood, tested for hæmolysis and agglutination, was found to belong to Group 2. The blood count taken on Dec. 15th, 1927, showed poikilocytosis and anisocytosis; erythrocytes, 1,200,000 per c.mm.; hæmoglobin, 16 per cent.; colour-index, 0·57; leucocytes, 2640 per c.mm. The differential white cell count showed: polynuclear neutrophils, 70·5 per cent.; polynuclear eosinophils, 3 per cent.; large hyaline cells, 3 per cent.; small lymphocytes, 19·5 per cent.; large lymphocytes, 3·5 per cent.; coarsely granular basophilic cells, 0·5 per cent.

Treatment.—Blood transfusion was considered inadvisable. An iron mixture was prescribed and daily injections of sodium cacodylate, gr. ½, were given. On the fourth day after admission liver treatment was commenced. This consisted of ½ lb. of fresh liver, finely minced, to which had been added orange juice and sherry. This preparation was given twice a day. Her condition rapidly improved and she was feeling well when she left hospital on Jan. 26th, 1928. She was next seen on May 19th, 1928, when there had been no recurrence of symptoms and she appeared in normal

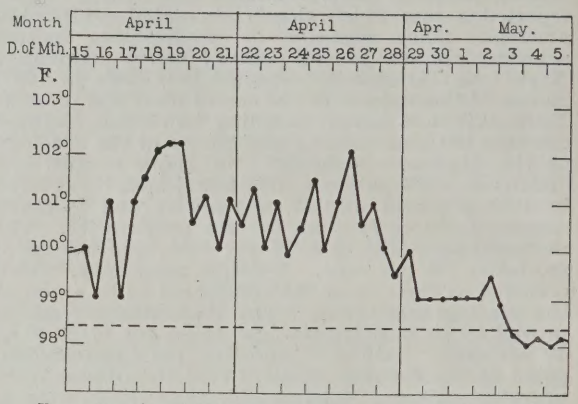
health. There was no œdema of the feet, but the spleen still remained easily palpable on deep inspiration. A blood count showed slight poikilocytosis and anisocytosis; erythrocytes, 4,700,000 per c.mm.; hæmoglobin, 60 per cent.; colour-index, 0·64; leucocytes, 6800 per c.mm. The patient was last seen on Sept. 8th, 1928, and appeared quite well. The intermediate blood counts in this case are recorded in Chart 1.

CASE 2, aged 32, was admitted to the London Hospital on April 15th, 1928, under the care of Dr. Theodore Thompson. Her first child was born nine years ago. She remained well during the pregnancy. There was delay during the first stage of labour, and delivery was aided by forceps; the puerperium was free from complications. Her second child was born two years later, the birth being followed by onset of pallor, weakness, and flatulence. The patient was given 25 injections for anæmia and remained in bed for three months. She had been unable to take medicine by mouth on account of indigestion. When her second child was 5 years old, the patient, who was then three months' pregnant, had a miscarriage; the medical attendant informed her it was a twin pregnancy. She was not anæmic at the time and remained in good health. For years she had suffered from painful hæmorrhoids, but bleeding had never been severe. In February, 1928, the patient, then seven months' pregnant, became very weak, pale, and short of breath, and noticed that her feet were swollen. She complained that her mouth was dry and her tongue very sore. There was no fever and no diarrhœa. On April 8th, the pregnancy terminated three weeks prematurely. The labour was easy and uncomplicated, and there was no excessive loss of blood. She became progressively worse and was sent to hospital. On the day before admission she had epistaxis, which was easily controlled. The three children had remained well and healthy.

On examination the patient was drowsy and apathetic, and when roused spoke or muttered incoherently, her cerebration being slow and her speech deliberate and often disconnected. Her respiration (28 per minute) was sighing in character and accompanied by conspicuous movement of the alæ nasi. She was extremely pallid and profoundly anæmic; her lips were almost colourless. The skin was of a deep buff colour. There was intense pallor of the mucous membranes but no jaundice.

Temperature was 100° F. on admission and during the first three weeks in hospital there was continuous or remittent pyrexia (see Chart 4). The tongue was dry and furred; the teeth showed no sepsis. The pulse (110 per minute) was regular and of fair volume, and the blood pressure was 130/90. A hæmic murmur was heard in the pulmonary area. There was gross œdema of the feet and legs. The fundus uteri reached to the upper border of the os pubis. The spleen was not felt. No abnormal physical signs were found in the lungs and the central nervous system. Retinoscopy showed normal fundi. The lochial discharge was normal in amount and colour, but offensive. On vaginal examination the uterus was found to be slightly enlarged, a finding consistent with the presence of some degree of subinvolution. Rectal examination revealed external and internal hæmorrhoids; there was no bleeding. A catheter specimen of urine was acid, with a specific gravity of 1015, and contained a trace of albumin and no sugar. A small deposit consisted of a few red cells, leucocytes, and epithelial cells; there were no casts present; culture grew *Staphylococcus albus*. There was no diarrhœa and the stools were normal.

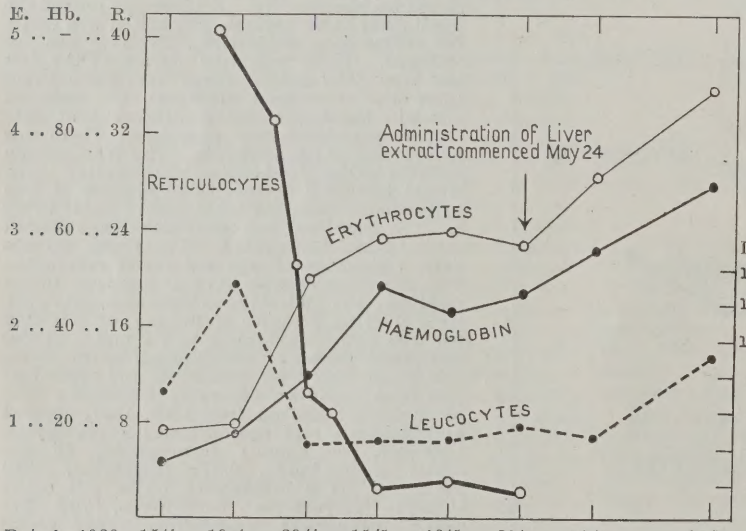
CHART 4.



Recording the temperature in Case 2 during the first three weeks in hospital.

The Wassermann reaction in the blood-serum was negative. The blood-serum calcium was found to be 9·2 mg. per 100 c.cm. The blood culture was sterile. The fractional test-meal (see Chart 2) demonstrated the presence of free hydrochloric acid in normal concentration in the gastric contents. The blood, tested for hæmolysis and agglutination, was found to belong to Group 4. Hæmolysis of the red cells ceased at 0·5 per cent. concentration of sodium chloride. The van den Bergh test gave a negative direct reaction; the indirect reaction was feebly positive, showing the presence of 1 mg. of bilirubin per 100 c.cm., equivalent to 2 units. There was no excess of urobilinogen in the urine. The blood count, taken on April 15th, 1928, showed a severe degree of poikilocytosis, anisocytosis, and polychromatophilia; erythrocytes, 900,000 per c.mm.; hæmoglobin, 12 per cent; colour-index, 0·7; 1 normoblast, 1 megaloblast, and 3 microblasts were seen in counting 200 white cells; leucocytes, 7000 per c.mm. The differential white cell count was as follows: polynuclear neutrophils, 61·5 per cent.; polynuclear eosinophils, 2 per cent.; small lymphocytes, 14 per cent.; large lymphocytes, 1 per cent.; large hyaline cells, 11·5 per cent.; transitional neutrophils, 2·5 per cent.; myelocytes, 7 per cent.; myeloblasts, 0·5 per cent. The erythrocyte and leucocyte count, the hæmoglobin content, and the colour-index, as well as the reticulocyte count, as found at subsequent examinations of the blood, are recorded in Chart 3. The blood count taken on April 19th, 1928, demonstrated extreme poikilocytosis, anisocytosis, and polychromatophilia; 24 normoblasts and 4 microblasts were seen in counting 200 white cells; myelocytes and myeloblasts were also present. In subsequent blood counts no primitive red cells nor white cells were seen.

CHART 3.



Illustrating progress in Case 2, as shown by successive blood counts.
E. = Erythrocytes per c.mm. in millions.
Hb. = Percentage value of hæmoglobin.
R. = ,, ,, ,, reticulocytes.
L. = Leucocytes per c.mm. in thousands.

Treatment.—On April 15th the patient was given liver prepared in the same way as that given in Case 1, but she vomited after each administration. Two days later a preparation of liver extract was given, but this also induced vomiting and was discontinued. As in Case 1, blood transfusion was considered dangerous in view of the grave degree of anæmia. The patient, however, made fair progress on general treatment, as shown by Chart 3. From April 29th to May 20th her condition remained stationary, and it was on the latter date that liver extract

(Boots), one phial twice a day—i.e., equivalent to 1 lb. of raw liver daily—was given and tolerated. The result was most favourable, the patient making a rapid and uninterrupted recovery. Re-examined on July 25th she appeared in perfect health and had remained free of symptoms. The same good progress had been maintained when she was last seen, on Sept. 8th, 1928.

Observations and Conclusions.

As in pernicious anæmia, so also in the severe anæmia occurring during pregnancy and the puerperium, the true ætiology of the condition still remains obscure. That achylorhydria is a prominent ætiological factor is not borne out by Case 2, as the fractional test-meal showed free hydrochloric acid in the gastric contents in normal concentration (see Chart 2). It is known [11] [12] that in anæmia following hæmorrhage or due to some other cause, a state of achlorhydria may be established as a secondary factor, being the result rather than the cause of the anæmia. Similarly the absence of free hydrochloric acid in Case 1 may have resulted from the severe anæmia present at the two previous confinements. The theory that the condition is due to syphilis cannot be seriously entertained; in neither of the cases reported here was there any history of syphilis, and the Wassermann reaction was negative in both. That there exists in patients suffering from the disease a natural predisposition to anæmia is difficult to dispute; but inquiry into the past history of the present cases proved that from childhood onwards they had both been perfectly healthy and had never previously suffered from anæmia.

The condition simulates Addisonian anæmia in many respects; thus in both instances there may be a great reduction in the erythrocytes, the presence of primitive red cells, an increase in the reticulocyte count, the presence of slight splenic enlargement, and finally the beneficial response to liver therapy. In both conditions, also, the established anæmia appears to be primarily dependent on the failure of the primitive cells in the bone-marrow to differentiate into the mature erythrocytes. Abnormal metabolites formed during the disturbed metabolism of pregnancy would appear to be the cause of the failure in the condition considered here. In cases reported in the literature a deposit of free iron was discovered in the various organs at autopsy. Investigations of the two cases reported here fail to give evidence of the existence of a hæmolytic agent. Jaundice was absent in both cases, and the van den Bergh indirect reaction was only very feebly positive. There was only a very slight excess of urobilinogen in the urine in Case 1 and no excess in Case 2. It will be noted that in both instances the hæmoglobin content was very markedly reduced. Hæmorrhage and sepsis are excluded as possible ætiological factors in both cases.

Each case illustrates how the anæmia, once established, tends to recur in later pregnancies, anæmia of a severe degree being present at the second, third, and fourth confinements in Case 1, and in the second and fourth in Case 2, both patients remaining well between the attacks. Furthermore, the anæmia may become more pronounced and its onset earlier during each successive pregnancy. Both patients were young, and the anæmia in each case followed the birth of the second child. When the anæmia becomes established during pregnancy, premature labour is the rule.

Although many cases recorded in the literature have terminated fatally, the prognosis is good, the disease having a natural tendency to recovery after parturition. Furthermore, as this investigation has established, the outlook is greatly improved by the immediate beneficial response to liver therapy. Charts 1 and 3 indicate the good progress made by both patients after the administration of liver. With such a remedy in our hands it becomes important to recognise this rare condition in its initial stages and to commence treatment before the onset of labour.

I am greatly indebted to Dr. Theodore Thompson for permission to publish the cases, and to Dr. P. N. Panton, Director of the Hale Clinical Laboratory, for the various tests employed in the investigation of both patients. I wish also to thank Dr. E. G. Frewer for his help in the investigations.

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Clinical and Laboratory Notes.

FOUR CASES OF APPENDICITIS SIMULATING OTHER DISEASES.

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SINCE the days when appendicitis was termed typhlitis or perityphlitis, and treated medically, great advance has been made in our knowledge of this condition. It is extremely seldom now that cases of acute appendicitis are left undiagnosed until their chances of recovery have been gravely prejudiced. Cases of subacute appendicitis with recurring attacks of colic are also usually operated on before they can become the cause of any considerable lasting damage to health. Nevertheless, the appendix can prove a most subtle and deceptive adversary, disguising itself under the symptoms of some other complaint, or causing symptoms so slight that they do not alarm the patient and often cause no great worry to the practitioner, unless he has made a very searching examination.

The pitfall of mistaking a subacute appendix, with recurring attacks and intervals of quiescence, for a duodenal ulcer is now generally appreciated and guarded against, but even yet it often happens that a chronic appendix in its later stages is erroneously diagnosed as tuberculosis, cancer, or some other wasting disease. A chronic appendix of long standing can cause as marked a cachexia as tuberculosis or a neoplasm, and it is very doubtful whether we diagnose it often enough during this phase. This is because the main complaint is often of weakness, lassitude, and loss of weight, and it is frequently only after a very searching inquiry that we learn that the patient has suffered from a "weak digestion" for a long time. This paper is based on cases seen at the Hertford British Hospital during the past six months. We are reporting four of the most striking cases which were sent to hospital wrongly diagnosed, but we have seen several others which, although correctly diagnosed when sent to hospital, had been treated for a considerable time—two of them for years—as other entirely different diseases.

CASE 1.—A woman, aged 28, was sent up to the out-patients' department with a diagnosis of cancer of the large intestine. For five days before admission she had vomited after every meal, the vomit being sour and copious. She had no definite pain anywhere, but suffered from a dull, heavy, uneasy feeling in the region of the umbilicus. She had never had a good digestion, and could remember being subject to attacks of vomiting even as a girl at school. As far as she could remember, this vomiting had never been

accompanied by any marked pain, but she often suffered from indigestion after meals. Four or five years ago she had been diagnosed as a pernicious anæmia, but a blood-film later disproved this. Her indigestion had become worse during the last two years, and eight months before admission she had been confined, since when she had been losing weight rapidly. She was very constipated and had been so for many years.

On examination she was anæmic and very cachectic, with sallow and putty-coloured skin. Her mouth was very sore, with small ulcers all over its mucous surface; the tongue was dry, furred, and extremely sore. The temperature was 97° F., the pulse-rate 120, and the pulse was soft and running. The subcutaneous fat had nearly all disappeared from the abdomen and the skin had lost practically all its elasticity. No tumour, apart from fæces in the descending colon, could be found. There was generalised abdominal tenderness on deep pressure, and over McBurney's point this tenderness was especially marked. The muscular resistance of the lower part of the right rectus was increased. An olive oil enema produced a good result, both flatus and large, hard constipated scybalæ being passed. The heart sounds were weak and of a fœtal rhythm; there was a hæmic murmur and pulsations in the neck. The white blood count was 15,000, and a test-meal revealed no free hydrochloric acid in the stomach. The patient was very toxic and it was impossible to undertake any operation until the general condition, and especially the state of the heart muscle, had been improved. She had been suffering from cardiac attacks for three weeks before admission, and two days after her arrival she died from syncope.

Post-mortem Findings.—Autopsy revealed a chronically inflamed appendix about 6½ inches long, with many adhesions between it and the cæcum. It was patent throughout its length and contained four small concretions. There was no neoplasm in the abdomen or pelvis. The kidneys showed microscopic chronic interstitial changes. The liver was in a state of fatty degeneration. The heart valves were competent but the microscope revealed much fibrous tissue in the musculature. The cause of death was obviously a severe toxæmia due to chronic appendicitis, the final stage being toxic myocarditis and heart failure.

According to her history this appendix had remained undiagnosed for a considerable number of years, probably since she was a girl at school. Indigestion had thus come to be an accepted feature of her life, and she did not think it worth while to consult a doctor about it. When she finally did ask advice about her general health too much importance was apparently attached to her general symptoms and not enough to her local ones, with the result that the possibility of an appendix was overlooked, and first pernicious anæmia and later cancer was suspected. Her confinement eight months before admission had overtaxed her already undermined health. It was the proverbial "last straw." She lost weight rapidly, had a constant uneasiness in the epigastrium, vomited after meals, and was so constipated that fæcal lumps in the large intestine could be felt through the abdominal wall. She had the cachectic sallow look so commonly associated with neoplasms, and superficially the clinical picture was very much like that of cancer.

There were, however, indications of a chronic appendix rather than of a malignant tumour. The long unbroken history of digestive disturbance is rather against cancer, for she began to have trouble about 15 years before admission and did not markedly lose weight until after her confinement. Again, she was rather young for cancer, although, of course, cancer cannot be ruled out by age. The leucocytosis (15,000), the quick soft running pulse, the definite tenderness over McBurney's point, and the increased muscular resistance in the right iliac fossa, pointed clearly to a chronic appendix, and these signs must have been there, waiting to be recognised, for some time.

CASE 2.—A young woman, aged 29, sent in as a pulmonary tuberculosis, complained of cough, with much sputum, lassitude, sleeplessness, headaches, and lack of energy. She had always been delicate, even as a child, and had lately become extremely nervous. She volunteered no further information, but closer questioning revealed that she had suffered from "biliousness" since her youth, and when she started work she adopted the unhealthy and irregular dietary which is unhappily all too common among typists. Her lunch consisted of tea and buns at a café, and when she returned at night she was usually too tired to bother to prepare a meal, and contented herself with more tea and some bread and cheese. Her sleep was very disturbed and she awoke in the morning unrefreshed, drank a cup of coffee, ate a roll, and went to the office, thus completing the vicious cycle. She was habitually constipated, and at times complained of severe pains around the umbilicus and in the right iliac fossa. Lately she had developed night sweats and a cough with scanty frothy sputum. For the past two months she had suffered from amenorrhœa. She had had heart trouble due to rheumatic fever since she was a child. She went to a doctor who diagnosed tuberculosis and sent her to hospital.

She was painfully thin and very anæmic. Her tongue was furred, her breath fœtid, and her teeth bad. Her temperature was 98·2° and her pulse-rate 110 per minute. Her chest expanded equally on both sides; there were coarse crepitant râles in both bases, but no dullness on percussion. Nothing else abnormal was found. There was a double mitral murmur. The white blood count was 22,000. X ray showed the usual marling at the bases, common in all city dwellers, but nothing else abnormal. No tubercle bacilli were found in three examinations of the sputum. There was marked diminution of subcutaneous abdominal fat, and loss of elasticity of the skin. On palpation we found slight generalised tenderness over the whole abdomen, slightly more marked over McBurney's point. The muscular resistance of the right rectus was slightly increased. Per rectum there was no tenderness. After she had been in hospital two days she developed an unmistakeable attack of appendicular colic. The urine contained albumin.

It was first of all necessary to treat the bronchitis, which cleared up in four days. Operation revealed a large, red, retro-cæcal appendix, covered with white flaky deposits of lymph. There were many firm adhesions between the appendix and cæcum. The lumen was patent throughout its length, the mucous membrane being very swollen and unhealthy. There was a large concretion at its tip.

Since operation the patient has never complained of any more pain in the stomach, her cough has never returned, and she has put on weight. Her teeth have been attended to, her dietary corrected, her colitis is being treated, and she is feeling much better. She does not get so tired, though her heart still causes her distress when she over-exerts herself.

In cases which present symptoms very similar to those of tuberculosis, but without any characteristic signs or X ray appearances, it is, we think, prudent to bear the appendix in mind and thoroughly interrogate and examine the patient. In this case, as in the majority, the mistake in diagnosis was due to incomplete examination. Without close questioning she did not mention her digestive symptoms, and without these the case certainly resembled pulmonary tuberculosis. However, after the bronchitis had yielded to treatment we were left with nothing abnormal in the chest, and while under observation she had an attack of appendicular colic, so that the diagnosis was made clear.

CASE 3.—A man, aged 34, sent in as a duodenal ulcer, had been ill for two years before admission. He suffered from intermittent attacks of boring pain in the epigastrium. The pain radiated through to the back. The interval between the attacks was originally two or three months, but for two months the pain had been continuous and woke the patient from sleep. It came on about an hour after each meal and continued until the next. He never vomited though he had suffered from nausea, which had become worse. Diet at first relieved the pain, but later failed to do so. There was no history of melæna, waterbrash, regurgitation of acid, or a bad taste in the mouth, but the patient suffered continually from flatulence. He was slightly constipated and had lost weight. During the preceding year he had been diagnosed as a duodenal ulcer and dieted; he improved, but became worse again immediately the treatment was stopped.

He was very thin and had a gastric expression. His teeth were good. His tongue was moist and lightly covered with white fur. The abdominal wall was very muscular, but subcutaneous fat had largely disappeared from under the skin. There was marked tenderness in the epigastrium in the mid-line, just under the costal angle, and slight tenderness over McBurney's point, but none over the gall-bladder or per rectum. The liver was not enlarged. The urine contained bile for three days after admission. X ray of the stomach showed a stenosis at the pylorus, and an irregularity in the outline of the greater curvature; the latter we attributed to gas. The meal was rapidly evacuated from the stomach and small intestines, and was all in the lower coils of the ilium and the cæcum in four hours. He was kept on large doses of belladonna for one week and

then X rayed again; the same stenosis of the pylorus was present, but there was no irregularity in the greater curvature.

The diagnosis lay between a pyloric ulcer and a subacute appendix, and therefore at operation we employed a right lateral incision, which enabled us to examine both these organs. The stomach was found to be absolutely normal, but the appendix was retro-cæcal, and very congested and inflamed. It was removed and found to contain a large concretion. Since the operation (five months) the patient has had no more illness.

Sir Berkeley Moynihan [1] has said:—

"More mistakes are made in a diagnosis of gastric ulcer than is the case in any other abdominal disorder. The stomach is an organ full of sympathy for other sufferers, and it speaks so loudly that its voice only is heard. We cannot rid the matter of error until we realise how very difficult the diagnosis of gastric ulcer really is, and until we decide that, no matter how confident the clinical diagnosis may be before operation, it shall not guide us during the operation too firmly."

The possibility that this case was an appendix was appreciated, but the radiographic appearances and the clinical picture kept the diagnosis in doubt right up to the time when the abdomen was opened. It would be well if, before a definite diagnosis is made of gastric or pyloric ulcer—comparatively rare complaints—the commoner abdominal disturbances, such as appendicitis and cholecystitis, were always excluded.

CASE 4.—A man, aged 57, had been treated for neurasthenia in various nursing homes for over four years before admission, and on one occasion had undergone Weir Mitchell treatment for three months. He complained of a "depression in the stomach which flew to his head." Questioning revealed that by the word "depression" he meant "a pain which left him weak." This affected him at any time and bore no relation to meals, although certain highly spiced or very rich meats would bring it on. He never vomited during these attacks of pain and had not lost weight. Lately he had become afraid of people, even members of his own family, because he thought they would upset his temper and thus cause his pain. He had been very constipated for many years. He had been unable to concentrate on his work, and had suffered from sleeplessness and bad dreams.

He was a well-nourished man, not of the nervous type. His temperature was 98° and his pulse-rate 79. His tongue was furred, but his teeth were good. Nothing abnormal was found in the chest. There was plenty of subcutaneous fat on the abdomen. The patient was very defensive, and a good deal of persuasion was required before we could examine him. He was definitely tender over McBurney's point and there was increased muscular resistance on the right side. The white blood count was 26,000, and nothing abnormal was found in the urine. A bismuth meal revealed nothing abnormal, but on palpation under the screen it was seen that the tenderness was localised to a definite point in the cæcum (presumably the root of the appendix).

At operation a long, patent, chronically inflamed appendix was removed. There were many adhesions between it and the cæcum. When opened it was seen to contain very thick mucus mixed with fæcal particles; the mucous membrane was œdematous and unhealthy.

Since operation (three months ago) the patient has complained of no more pain and no more nervous symptoms. He is being kept on a diet for his colitis.

The diagnosis of neurasthenia in this case must have been due to failure to make a complete and careful examination. The patient had many neurasthenic symptoms but a chronic appendix was the beginning of his trouble. He was not, however, the type of man to accept indigestion as an everyday feature of his life. He had never had it before the age of 53, and, as prolonged treatment failed to cure it, the pain "got on his nerves." He would wait for it and live in daily dread of it. It is worthy of note that if a man of 50 complains of persistent indigestion for the first time in his life, it is very seldom that no organic cause can be found, and neurasthenia should be the last diagnosis. Before any man, young or old, is treated as a nervous dyspepsia the appendix should be absolutely excluded. A white blood count is often very helpful in pointing to the existence of inflammation, and it is probably not done often enough.

All these cases emphasise the need of a thorough and careful examination of every patient, no matter how trivial his complaint may seem. First impressions, though lasting, are not always correct; therefore let us avoid them.

[1] Brit. Med. Jour., 1919, ii., 765.

REMARKS ON COLONIC LAVAGE.

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A YEAR ago Dr. Chalmers Watson and Dr. P. De made a communication to THE LANCET [1] entitled Unrecognised Toxic Substances in Human Fæces. This paper, which was stated to be frankly provocative, was read before the Medico-Chirurgical Society of Edinburgh, when Dr. Watson invited commentary from practitioners whose independent observations of facts brought under their notice, he said, would be useful. Thus encouraged, I venture to publish some notes upon colonic lavage in particular relation to Dr. Watson's remarks upon the more than occasional confusion among medical men and nurses as to what may constitute normal fæces and what the evidence may be of an elementary toxæmia. His reflections here are practically concerned with colonic lavage, and during the 12 months that have elapsed since Dr. Watson's paper was read in Edinburgh I have taken notes of certain patients and have also availed myself of opportunities to see the technique employed at various centres.

Colonic lavage as a means of treatment, and to some extent as a means of diagnosis, is becoming more employed in this country—that is common knowledge; and if it is not used so extensively as in America and in Germany, that is perhaps partly because the treatment is with us very often left in the hands of unqualified persons who are not all equally capable of understanding either the reasons for the procedure or the results of the lavage. There have been articles written in lay and semi-medical publications in this country which have described the procedure. These articles have sometimes gone so far as to attribute to conditions of the large intestine the degenerative changes which are associated in a natural way with old age; consequently that big proportion of the population that wishes to stay youthful has concluded that any method of removing toxic waste products from the bowel and changing the intestinal flora may meet their object. The result has been that in this country colonic irrigation has run a risk of not taking its right place in scientific procedure, while—and this is serious—the treatment is administered too often by unqualified people whose results may easily fail to give satisfaction, and so discredit the procedure. Especially is this so because the lay agent almost naturally regards the washing out of the colon as the whole treatment of the case, whereas it is only a mechanical aid to general therapeutics. It is not profitable to send a patient suffering from auto-intoxication or even constipation to have lavage now and again, for while general symptoms may thus be relieved the cause of the condition will not be removed. This will be known to the qualified practitioner, and will be discovered by the patient, but many who administer lavage will consider that with a temporary relief success has been achieved. When the treatment is administered upon qualified advice precautions will be taken to see that there is no source of sepsis in teeth and mouth, pharynx, tonsils, or nasal channels, which would provide a continuance of the infection. Cases which had already been submitted to lavage I have found to remain substantially unaltered because the conditions of the intestinal

[1] THE LANCET, 1928, i., 174.

flora have not been recognised, and no attempt has been made to meet them by diet and acidophilous therapy.

Indications.

Colonic lavage is described in text-books, especially American ones, in sections upon the treatment of chronic constipation, and in such cases, although it does good to remove stale fæces, permanent improvement is not established by merely emptying the colon. The cause of the constipation must be ascertained, the proper diet arrived at by trial and expert massage, and graduated abdominal exercises must accompany the treatment. It is hardly too much to say that the most important part of a colonic irrigation treatment is usually the accompanying massage, for only through massage can the general tone of the colon be improved, while from the patient's point of view this measure has the advantage that they can be taught to massage themselves, a procedure that would usually only occupy some 20 minutes every morning. Colonic irrigation with accompanying massage, and instruction about exercise, will be of value only if the removal of any septic foci that can be detected is insisted upon. Then the following common conditions, perpetual headache, "biliousness," flatulence, and many signs of indigestion and constipation will be removed, but the lavage must be employed in the right way and at the right time. The same may be said in regard to many forms of colitis and many manifestations of so-called rheumatism, of gout, sciatica, and neuritis, things which were mentioned by certain of the speakers at the conference this summer in Bath on Rheumatic Diseases and put forward by Sir George Newman in his Presidential Address.[2] In Germany, in so-called rheumatic cases, where the discovery of the septic focus is in question, it is usual to examine the results of a lavage to ascertain how far the intestine may be mechanically at fault, the procedure not excluding bacteriological examination. These cases make up a large group in a general medical practice; in many of them temporary relief will be obtained promptly by lavage, but if permanent removal of the disability is to follow treatment considerable general care of the patient must accompany the procedure. In more serious diseases colonic lavage can only be looked at in the light of a general health measure. Many mental conditions, and some forms of asthma, may derive great temporary benefit in this way, and particularly in certain subjects lavage of the colon makes a difference to the sense of well-being that may manifest itself in circumstances of physical or mental strain; but I am not advocating the use of what properly employed is an important therapeutic measure as a temporary dope. On the other hand, of those who might say that to recommend as a general health measure a procedure that is not natural—namely, washing out of the colon—I would ask how many people in crowded communities or taking part in the usual social intercourse of to-day do lead natural lives?

Method.

Since the publication of Dr. Watson's paper I have looked into various methods of colonic irrigation that are commonly employed, and it is clear that they vary so much that the amount of benefit obtained from them must vary also. Visits were paid to various health resorts—Plombières, Harrogate, and Bath among them—and at clinics every opportunity was given to me of observing the technique. The quantity of fluid used was not constant, the amount ranging from one to as much as five or six pints; the sterilisation of apparatus was more carefully attended to at home than abroad; the rapidity with which injections were given was very different in different clinics; nor was the height of the containing cylinder determined by any fixed rule. The variations I could understand to be right, but only if the reasons for them could be seen to be related to particular cases. My own procedure, unless a practitioner in charge of the case desires me to vary it, or unless there are other and particular indications, is to give a quarter of an hour's massage and two douches of two and a half pints each, with variations of the douche to suit the requirements of the case.

I wish to advance the following points: (1) Colonic lavage should be done under the direct supervision of a qualified practitioner. (2) The amount of fluid used must vary according to the capacity of the patient, and the fluid should be used as slowly as possible to avoid dilating the colon, but to make any fixed rules in the matter is wrong. (3) The actual fluid used can be varied according to the symptoms of the patient—there are stimulating and there are soothing douches which can be employed in accordance with the conditions. (4) The value of colonic lavage is not obtained when it is only employed as a temporary measure, and by itself, to relieve some symptoms that are often self-diagnosed. Its real value is seen when it forms part of a general treatment in connexion with massage and appropriate diet, and when it is directed upon medical lines towards definite therapeutic objects.

[2] THE LANCET, 1928, i., 981.

SUBMUCOUS INJECTION OF HÆMORRHOIDS WITH QUININE UREA HYDROCHLORIDE.

BY CHRISTOPHER HOWARD, M.R.C.S. ENG.

THIS method of treating hæmorrhoids was brought before the medical profession at large by the publication, in France, of an article[1] by Dr. Bensaude, of L'Hôpital St. Antoine, Paris. Bensaude had been working on this method since 1921, and had therefore had very considerable experience before he published the details. At the time of writing the article he had tried his method on some 4000 cases. The number has now reached nearly 5000, and the method is still unassailable from the point of view of accidents or serious complications. With the exception of minor differences of technique and the difference in the solution used, the procedure is not unlike that advocated by Mr. A. S. Morley in this country. The use of quinine urea hydrochloride has, I think, one definite advantage over oily solutions of drugs that will produce sclerosis in that it has a local anæsthetic action and is not only absolutely painless but relieves any rectal pain that may have been present when the patient presented himself for treatment. An outstanding advantage of the treatment is its rapidity. Watching Dr. Bensaude work in the out-patient clinic is apt to cause astonishment at the speed and facility with which large numbers of cases are treated. In the private consulting-room, of necessity, the operation takes longer, but even when the procedure is a strictly one-man operation the whole thing can be carried out in ten minutes to a quarter of an hour.

Having watched Bensaude and being convinced of the tremendous value of this work, I started it some six months ago, and think that the experience gained may be worth attention, although it is limited.

Apparatus.

The solution used is a 5 per cent. solution of quinine urea hydrochloride. This is put up in 5 c.cm. ampoules, and keeps indefinitely; it does not need a large needle as it has not the viscosity of vehicles such as oil or glycerine. A proctoscope is necessary, but no particular model is indispensable—the simpler the better. Bensaude uses his own model, which has a long handle so that the hand which is controlling the instrument does not impede the vision. It also has a bevelled edge which, by the introduction of the obturator, can be turned round the full circle, bringing into view whichever arc of the rectum is desired. The best syringe is a 5 c.cm. model with an extension, made by Collin. It has two semi-circular extensions under which the index and middle finger of the hand can slide, and this enables the operator to control the point of the instrument with accuracy and to get a fair idea of the amount of pressure needed to drive the fluid through the needle. To the nozzle of this syringe is attached an extension about 4 inches long, and on the end of this, by an ordinary press-on joint, is fitted a 1 cm. platinum needle. It is

[1] Bensaude, R., and Cury, P.: Presse Méd., 1928, xxxvi., 706.

essential to use platinum because the ordinary steel needles affect the solution and cause precipitation and consequent blocking of the lumen. Platinum is excellent in every way, for it does not have this effect on the solution; it remains sharp for a long time; it is easily sterilised, and is very unlikely to snap. The long extension is necessary because in some cases of marked varicosity the vein may extend up the rectum as far as Houston's valve, and the injection may have to be made as far up as this. The only other necessities are two or three stick-swabs. These should be firm and strong so that, if necessary, exudate of the fluid through the puncture hole made by the needle can be controlled.

I am convinced that the most important requisite, apart from the essentials already mentioned, is a good light, for the whole object is to place the solution between the vein and the mucous membrane of the rectum and not in the vein itself. When working alone I find the best lamp is one made by Davidson, which by an arrangement of lenses throws a very good, even light, concentrated in a beam which fills the bore of the proctoscope, and so throws very few shadows. A high voltage lamp, situated over one's shoulder, has advantages, but, though admittedly it gives a strong light, there is too much play of reflection from the shining surface of the proctoscope lining, and consequently visibility is impaired.

Perhaps the most important part of the operation is absolute sterility. When dealing with a highly septic area, such as the anal canal, there is a temptation to be careless.

It might be justifiable to recall a case which occurred some little time ago, which is impressive, and which will act as a reminder that great care is necessary. In this particular patient a spreading ulcerative colitis supervened on pile injection with a carbolic solution in oil, which was followed by sloughing, septic absorption, and death. At the post-mortem examination it appeared evident that the lesion originated in the injected pile, and, though probably the resistance of the patient at the time of the injection was very low, that does not lessen the importance of the argument in favour of a careful technique.

As an antiseptic solution, the French tincture of iodine is the most suitable. It does not sting the patient and is stronger than the tincture of other countries.

Operative Procedure.

The instruments required—that is to say, the various portions of the syringe, the proctoscope, the obturator, and the swab-holder—are all taken direct from the steriliser just long enough to give them time to cool before they are actually needed. Gloves are always worn, and a finger-stall is placed over the index finger of the glove to make the preliminary examination before the injection is given. Where an extensive digital examination is necessary in a new patient seen for the first time it is as well to change the gloves after the examination. Plenty of lubricant is necessary for the painless introduction of the proctoscope, and K.Y. jelly is the best. This is slightly antiseptic and not greasy, a point which anyone who has ruined clothes or carpets with greasy lubricants will much appreciate. For examination the genu-pectoral position is undoubtedly the best, but for treatment the left lateral is to be recommended. The patient feels a slight prick as the needle enters the mucous membrane, and most people can bear pain better lying down than in an awkward position such as the knee-elbow. Furthermore, in the nervous type of patient, one has to remember that one is dealing with a highly sensitive area, and better relaxation is obtained if the patient is lying down.

When the anuscope is inserted with the light focused up the tube it will be possible to see in great detail any pile-bearing area in the rectum. One makes a mental note of the position where the piles are most obvious, and then carefully traces them up until no further sign of the varicosity can be observed. Just before this point is reached is the point where the first injection should be made. Successful treatment depends entirely on finding this position and on making the injection around the vein, and not in it or through it. It is rather difficult at first to control the end of the needle, as the needle with the extension is such a long one. Attempts to control the tremor of the hand by taking thought usually result in increased tremor; however, in a short time the speed attained will do away with this.

When one has decided where to make the first injection a stick swab is pushed up, soaked in iodine, and the area carefully swabbed. The injection is then made, the amount given being sufficient to produce a definite wheal under the mucous membrane. Recognition of the point at which a sufficient quantity of fluid has been injected depends on the sense of definite resistance to the plunger of the syringe transmitted to the thumb. It is only by practice that some sort of constant can be obtained, but this is undoubtedly the best guide to correct dosage. The striæ produced, which have elsewhere been advocated as the signs of correct dosage, are of little value, because their appearance and intensity depend on other factors besides the submucous pressure—factors such as the condition of the mucous membrane and the amount of distension of the rectum.

Most patients do not complain of any pain and the prick of the needle often passes unnoticed. If the patient should complain of pain it is usually a sign that the needle has not been put in correctly and has been plunged too deeply or too shallowly. In the latter case the mucous membrane is being forcibly stretched and a considerable amount of pain is produced.

After the injection has been made and the pressure on the piston of the syringe has reached the point at which the needle is withdrawn, the proctoscope is drawn down the rectum and another injection is made, again swabbing the area, below the original injection. It is seldom necessary to give more than 3 c.cm. at any one sitting, and it is useless to try to hurry things by injecting too much. If one created three large bullæ by the injection of quantities of the quinine urea hydrochloride they would be of no use because they would probably act as an irritant to the bowel and produce a motion; the passage of the motion would squeeze their contents out again through the needle-puncture hole. On the withdrawal of the proctoscope a suppository is inserted to keep the walls of the rectum apart, and prevent any exudation from causing the opposing surfaces of the mucous membrane to stick together. This would produce pain on defæcation which the suppository will prevent, and, further, the suppository is an additional antiseptic guard. I use "Kuranol" suppositories (Roberts and Co.), which contain bismuth, witch-hazel, and carbolic, and have proved very satisfactory.

After the injection the patients should not do anything active for half an hour. They are sent back to the waiting-room and kept there quietly for the full 30 minutes. Many of them rather protest at this, as they feel perfectly well, but my experience is that if they go straight out they are liable to develop quite intense rectal pain an hour or so later. I can offer no explanation of this, but it is an observed fact, and the rest after the injection prevents it.

There are no sequelæ, except that in about 10 per cent. of the cases the injection is followed by an urgent desire to defæcate. This does not occur, as a rule, until at least ten minutes or so after the injection has been made, so that it need not be an embarrassment to the patient. Bensaude describes it as common, but in my experience it is not. Of complications, likewise, there are none of importance. When injecting the anterior pile-bearing area a certain amount of prostatic pain may be produced, but this does not occur unless the injection is badly made. The patients generally seem more sensitive here and feel the needle more than they do in other arcs of the circle.

Injections should be given only at weekly intervals and from six to eight is the average number required. It is as well to work diametrically across the imaginary clock circle which represents the rectum; that is to say, if the first injection is made at 6 o'clock the next should be made at 12, then at 9, then at 3, and so forth. If a bad injection is made and a pile is entered no harm will occur. The pile will either

remain unaffected or shrinkage will follow in the same fashion as in a varicose vein injected with quinine urethane or salicylate of soda.

It follows as a natural corollary from the general description of the technique that it is no use injecting external piles or piles when they are down. Prolapsed piles can, however, be replaced and the injection made immediately without any trouble. As in all injections of this nature, it is better to wait until the patient is free from any staphylococcal infection of the skin and to have any known septic areas treated before commencing the course.

This seems to be in every way a method of treating piles which deserves respectful consideration. It is painless; it is ambulatory; it is effective, and it can be performed by anyone who will trouble to master the technique. The pathological action—that is, the formation of a fibrosis around the neck of each pile—is a sound one in theory and in practice works well.

Medical Societies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT a meeting of this Society held in London on Dec. 21st, with Dr. J. HOWARD-JONES, the President, in the chair, a discussion took place on

MENTAL HYGIENE.

Dr. RALPH CROWLEY said that the Society had not dealt with this subject as a definite part of its work and organisation; therefore some reference must be made to general principles as well as to details. It was a new movement, and those who had spent any considerable time in the United States would have been able to appreciate how great a movement it was. The whole idea of prevention as applied to mental disease, to subnormal mentality and defect, had really burst upon the medical profession. In America the prevention of insanity, delinquency, and mal-adjustments of all kinds could be said to be the talk of the town. This very familiarity, however, constituted a danger—greater in America than it was likely to become here—for people were attempting to deal with the question who were neither expert nor fully qualified. A consequence of this was that false hopes and expectations were raised. The prevention of mental defects and neuroses would probably be much more difficult than the prevention of physical troubles. It was clearly a task which the public health services must take on, though in America it was largely left to private enterprise. So great, however, had been the calls on public health administration in this country during the last 30 years that it seemed almost too much to ask that this new sphere of activity should be added to it. It was not very long ago that the main concern of the public health officer was with the grosser forms of detrimental environment; then, with bewildering rapidity, he had to get into touch with the individual through the infant welfare centres and the school medical services. If the public health officer should now attack the subject of mental hygiene it would make this individual touch even more intimate. Mental hygiene implied an attempt, in a concerted way, to deal with the causes and prevention of insanity, of crime, of delinquency, as well as of those less marked abnormalities which were probably at the base of many of the gross departures from the average. A good deal of valuable knowledge on this matter was now available, but it was not being pressed into service. And he did not think proper use would be made of this knowledge unless it was by the public health services. The work would also bring the medical officer of health into closer touch with other organisations and workers, those in contact with activities in the home, the school, and the court. To get real results in mental hygiene it was necessary to study social aim and method. It was hoped that the result of this new aim would be a uniting of two streams—i.e., the physical and the mental. The actual work would devolve on the expert physician and the expert psychiatrist, and in the future these expert services would be increasingly needed. The public health services provided an unrivalled opportunity for linking up all other activities, and also for planning over a long period of time, for following up, and for making systematic records. There must be channels along which the work of the expert could be made effective. He urged that there must be a concerted mental hygiene campaign by professional and lay workers. Many psychiatrists in America complained of the lack of channels along which their work could flow. The school medical services could make a great contribution in the study of the normal child, giving a definition of "mental health." A well-known authority in America had declared that 250,000 of the boys and girls in high schools would, in time, be in asylums, that a similar number would be in serious conflict with the law, and that a host would have their lives blighted by a variety of causes, many of which could reasonably have been prevented. In this country the proportion of delinquent children was certainly less than in the States, but the lesson was instructive. The key to the situation seemed to lie in the problems of behaviour in children, which so many people regarded as trivial. It was necessary to ask which features of the child's behaviour were transient, which were permanent, which were single traits, and which were accompanied by other manifestations. There was also the further question—what sort of organisation was needed to investigate and find a solution of these problems. He hoped special attention would be devoted to the budding delinquent.

The child-guidance clinics in America had four main functions. They were centres of service for the child, centres of educational propaganda, centres for training (doctors, psychologists, and welfare workers), and centres for research—since every faithful record was a piece of research work. He did not think the main development of this activity would come, in this country, through our hospitals; it must come through more normal channels, those of education, the school medical service, the local health service. Both psychiatrists and welfare workers should be available.

The Adult.

Dr. EDWARD MAPOTHER confined his attention to mental hygiene as it concerned the adult. He laid stress on three of its aspects: the importance of mental disorder, the main defects in the present provisions, and some suggested remedies. To him, mental disorder meant a bodily disease whose main manifestation were abnormalities of behaviour and consciousness. But it must be recognised that the differences which underlay might be merely of the same kind as constituted differences of character and temperament in normal people. They were perhaps more extreme in development, but essentially the same in kind. Mental disease could be divided into organic and functional. There were four main factors in causation: (1) heredity; (2) some abnormality, perhaps incidental to a certain age or epoch of life—such as the menopause; (3) mental stress; (4) physical stress.

In speaking of mental hygiene it was necessary to include a consideration of early treatment as well as prophylaxis in the strict sense. In practice the opportunity for the prophylaxis of mental disorder scarcely arose; certainly it did not in the case of the adult. Some mental disorder arose as a by-product in the struggle against physical conditions which were injurious in themselves. For example, successfully combating venereal disease, or focal sepsis, had as a sequel a reduction in mental disease. In regard to functional mental disorder, prophylaxis in advance of the development of symptoms was, in amount, practically negligible. Positive eugenic measures he

did not regard as practical politics at present; our knowledge of heredity was not yet ripe, and our knowledge of any unitary mental characters which might be transmissible as such was practically nil. No satisfactory methods were available for combating abnormalities arising in adolescence, after childbirth, or in old age. And as for shielding the neurotic or the potential neuropath from stress in advance of his having displayed his attributes, Dr. Mapother was against attempting anything of the sort. Much of the best work of the world had been done by potential neuropaths putting up a great struggle against the risk of a breakdown. In this connexion there was much greater need for a doctrine of courage than for one of caution. But these remarks were not applicable to early treatment which checked the spread or development of mental disorder after its appearance.

The last figures of the Board of Control showed that at present there were in this country 42,000 congenital mental defectives, either in institutions or under some statutory supervision. That, however, was far short of the total number. The cost of these was in large part disguised under such headings as crime and pauperism. The certified insane, in whom mental disorder had developed during life, numbered 140,000. There were 21,000 fresh admissions yearly, and 9000 died, and 10,000 were discharged yearly, leaving an accumulating balance of 2000 a year. No figures were available about the incidence of neuroses, for the reason that nothing was done in connexion with them. But there were some striking neurosis figures furnished by the war statistics. Of the disabilities which resulted in the granting of a pension, 40 per cent. were due to wounds and 60 per cent. to medical disabilities, 12 per cent. of the latter being attributable to neuroses. In peace time, too, a large proportion of the people attending hospital out-patient departments were suffering from neuroses, which, if treated at the beginning, would have been cured.

It was an axiom as regards physical disease that any person in a civilised community was entitled to the remedial measures available for his relief, and if he could not himself pay for it, it was for the community to do so. No similar point of view, however, had been adopted in regard to mental disorder in this country or any other. Here the community —at any rate as a rule—did not concern itself with mental disorder until the patient had reached the stage in which he was incurable. It was only in so far as the person became a burden or a nuisance to others, or showed suicidal tendencies, that his care became the duty of the law or the community. This was a state of affairs which stood a good chance of being remedied in the next ten years. At present, for practical purposes, there was, for the poor, no provision of treatment in the uncertifiable stage of mental disorder. Secondly, there was a complete inability, even for the certifiable patient, to get treatment without submitting to the indignity of a detention order, which necessarily associated him with a number of chronic and protesting patients, though he himself might be quite a willing one. A third, and large, defect was in respect of even those who could pay for themselves, that they could not, if in a certifiable state, have voluntary treatment except in a mental hospital in contact with chronic and protesting patients. The proper way to deal with abuses which might arise through treatment of certifiable people in nursing homes was to insist on the registration and inspection of such homes and the notification of cases admitted to them, power being given to visit with heavy penalties the treatment of cases elsewhere. Whilst there was a good deal of agreement in principle about remedies for defects in present conditions, there was much divergence of opinion on details. The recent Royal Commission had insisted on the necessity of abolishing detailed formalities, and on opening up voluntary treatment of mental trouble in the poor. All were agreed that the two main requirements were research in causation and a very much improved training of medical men, so that they could recognise the beginnings of mental disorder and arrange for the appropriate treatment of their patients. But how far would the real difficulty of obtaining early treatment be solved by the mere reduction of formalities? What deterred the public was the certificate. The objection of early recoverable cases to going into mental hospitals—which he regarded as a reasonable objection—was unlikely to disappear in the lifetime of the average adult now living. It must be recognised that for a considerable period after the onset of mental disorder the treatment should be entirely apart; that the large mental hospitals should increasingly be places for treatment in the later stages of mental disease. The essential requirement was what had been found acceptable in the progressive countries of the world—i.e., the provision of clinics at which early stages of mental disorder were treated on an entirely voluntary basis, these also serving as centres for research and for teaching. This solution might be only practicable in large centres of population; still he felt very strongly that it was an ideal which should be held up as the form of provision really required.

The Child.

Dr. LETITIA FAIRFIELD said that the idea of mental hygiene was a very new one in public health, and it was one of the matters on which America was ahead of this country. In the States people were interested in covering the whole range of mental life with the same thoroughness as the physical was covered in this country. What had been well grasped across the Atlantic was the necessary contact between the school and the public health in relation to the mental hygiene in children. There, for the very young child, had been established "habit clinics," which she had seen at work in a number of cities. The psychiatrist and social worker coöperated in the training of character, and all kinds of help from outside was enlisted. Every factor, such as home life, school, personal associations, and conduct was investigated, and the psychologist determined the standard of intelligence, which was regarded as very important. In this country, when a really intractable failure in a child was met with, there was a tendency to let it slip. There seemed to be no provision for dealing with the very difficult child, and even such conditions as enuresis were allowed to go on, largely because the technique of dealing with them had not been properly worked out. It was, she insisted, very important to lay the foundation of mental hygiene by largely increasing the psychological and character-training side, which had already been started in connexion with child welfare. In large towns at least it might be well to devote one afternoon a week to consultations with a trained psychiatrist. The great bulk of this work would come through the school medical service. There should be less talk of what wonderful things the psychologist could do with cases taken to him from the children's courts or juvenile courts; the great effort should be directed to dealing with them before they got there. The origins of crime often lay in emotional and environmental defects in earlier life which had been allowed to pass untreated. If cases were dealt with at school age they would have been caught before defects had been hardened into habits and before the child felt he had a definite grudge against society because of some punishment received. It was surprising, said Dr. Fairfield, how much an emotional interference with work might keep a child back in school work. The temperamental type of child was very important from the standpoint of the early development of neuroses, and she gave several instances of the perpetuation of the condition into adult life, with consequent lessening of quality in work and continual conflicts with associates. Many people supposed that insanity would be stopped if only an interview with the doctor could be secured early enough; this disturbed people's views and increased their expectations to an unreasonable extent. Hope lay in making provision for nervous and mental disorders on the

same scale and on the same principles as provisions already existed for physical disabilities. It could not be too much emphasised that this was a matter for experts. Apparently simple cases, which seemed to need only common sense, really needed expert handling.

A brief discussion ensued.

Reports and Analytical Records.

BASY BREAD.

(BASY PRODUCTS CO., 4, LANCELOT-PLACE, BROMPTON-ROAD, S.W.3.)

THE claim is made that this bread is a true digestive food and reduces weight without causing flabbiness or wrinkles. When eaten in place of white bread it supplies the necessary roughage to promote functional activity. The crust of the cylindrical loaf is segmented to enable slices to be cut evenly without waste. The weight was 1 lb. 11 oz. and the price 1*s.* 6*d.* It is an agreeably flavoured brown bread.

On analysis the following results were obtained :—

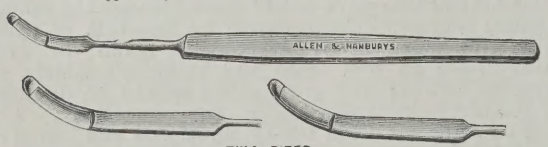
Moisture	38·60 per cent.
Altered starch and dextrin	43·70 ,,
Protein	8·65 ,,
Mineral matter	1·96* ,,
Sugars	4·85 ,,
Crude fibre	1·50 ,,
Fat	0·74 ,,
	100·00
*Containing—Iron (Fe_2O_3)	0·004 ,,
Phosphates (P_2O_5)	0·2 ,,
Matter soluble in cold water	12·28 ,,
Calorie value per lb.	1095

On comparing these figures with those of other breads it will be noted that the fat is distinctly low and the protein rather high, and this tallies with the statement that the bread is nutritive rather than a fat former. The mineral constituents are also on the high side.

New Inventions.

MENISCOTOMY KNIFE.

ACCURATE division of the posterior end of the so-called bucket-handle lesion of a semilunar cartilage close to its attachment to the bone is difficult or impossible with a straight tenotome or other knife. The advisability of dividing the cartilage close to the tibia arises from the occasional finding of a tag at the back of the joint, with its sole attachment to the rest



FULL SIZES

of the cartilage close to the bone. To avoid such a tag being missed, the dividing knife must cut close to the bone in an oblique plane. The curved end of a Macdonald's dissector has been found a useful instrument for determining the precise direction in which the knife should cut. I have, therefore, had made for me a knife with a similar curve, a probe point and a short cutting edge, and this has been found to answer the purpose admirably. Since it is wiser not to use a double-edged knife inside the knee-joint, the knives are made in pairs, to cut to the right and left respectively. Experience has shown that these knives are sometimes useful in knee-joint surgery for purposes other than that for which they were designed.

Messrs. Allen and Hanburys are the makers.

H. A. T. FAIRBANK, M.S. Lond., F.R.C.S.Eng.

Reviews and Notices of Books.

A TEXT-BOOK OF MEDICINE.

By Various Authors. Edited by J. J. CONYBEARE, *M.C.*, M.D. Oxf., F.R.C.P., Assistant Physician to Guy's Hospital. Edinburgh : E. and S. Livingstone. With 16 illustrations and 8 plates. 1929. Pp. 976. 22*s.* 6*d.*

OF recent years there has been a tendency for text-books to be compiled by a series of authors. The personal note may be somewhat lost in the process, and perspective may be a little distorted, but additional completeness and accuracy can be expected, though we are happy to remember that at least one famous text-book was written almost in its entirety by a single author.

Dr. Conybeare's text-book is not entirely the work of his own hand, but he has written the greater part of it, besides acting as general editor. He has had assistance from Dr. W. H. Craib ; from Dr. G. B. Dowling, who contributes the dermatological section ; from Dr. E. H. R. Harries on the infectious diseases ; and from Dr. Maitland-Jones on diseases of children ; Mr. V. E. Lloyd writes on venereal diseases, Prof. H. MacLean on renal disorders, Dr. Geoffrey Marshall on respiratory diseases, Dr. Trevor Owen, of Toronto, on diseases of the liver and pancreas, and Dr. F. M. R. Walshe contributes the neurological section. This collaboration does not lessen the responsibilities of the general editor, since a very high standard may properly be demanded from expert contributors. No large text-book on its first appearance is ever free from slips, but there are scattered through the book a few mistakes that are not trivial. For example, the significance attached to the different tests for ketone bodies in the urine (p. 298) is not that generally accepted. The notes on the van den Bergh reaction, on pages 624 and 625, are neither clear nor correct ; and in the section on oral sepsis (p. 550), though pyorrhœa alveolaris and apical infection are discussed, no mention is made of dental caries.

In the section dealing with the nervous system Dr. Walshe describes the common diseases admirably ; the diagrams are well chosen and suffice to explain the text. Dr. Conybeare has himself dealt with the diseases of the stomach and most of the alimentary canal ; the sections on gastric and duodenal ulceration are very good indeed. The rare type of cancer known as linthus plastica is omitted, though the Plummer-Vinson syndrome receives notice. The unqualified support of surgery in all cases of acute pancreatitis (p. 654) is somewhat surprising. Prof. MacLean devotes most of the space alloted to him to a description of nephritis in its œdematous and uræmic forms. This has been the practice in continental text-books for many years ; Prof. MacLean is careful to explain its shortcomings, but considers that such a classification is of greater practical value to students than one based solely on morbid anatomy. It is open to doubt whether a clinical classification of such simplicity on the surface is likely to prove of advantage to students at a time when it is being gradually abandoned by its supporters and originators on the other side of the Channel. The section on the infectious diseases might be improved by the use of small diagrams to illustrate the age and seasonal incidences of the various fevers. All the accounts in this section are thoroughly up to date and are written in a brisk style. In the section on diseases of the cardiovascular system a plea is made for greater recourse to the electrocardiograph, and the diagrams in this section are drawn from it. The importance of knowing what the heart is doing, rather than what it is saying and murmuring, is constantly kept before the reader. The article on the anginal syndrome is perhaps a little too brief, but all the other parts are well balanced and the essential points made clear. The section on the diseases of the respiratory tract opens with some welcome simplified dogma on the subject of the physical signs

in the chest, continues with descriptions of the chief respiratory diseases, and includes a subsection describing allergic conditions of the respiratory tract. The articles on pneumonia and bronchiectasis have been cleverly condensed. Tuberculosis has been relegated entirely to that part of the book devoted to the infectious diseases; the whole subject occupies only 40 pages of closely packed matter, and can be read in a couple of hours without giving rise to exhaustion, though it could not be properly digested at one reading. We miss a section of psychological medicine and insanity, though diseases of children and dermatology find a place, and the few pages beginning on p. 877 would have been better expanded and amplified into a section separate from neurology.

In his preface Dr. Conybeare points out that he has made no attempt to render the book in any way a substitute for manuals of clinical methods. His aim to produce a complete text-book in as small a compass as possible and at as low a cost has been well attained. If in a future edition space is required for new work, the long description of the history of vaccination on page 45, and the detailed technique described in the following pages could be omitted, for this matter is not strictly essential in a volume in which economy of space has been the plan. It is questionable, too, whether the editor's excellent notes on examination for life assurance are relevant in a volume which deliberately avoids many of the minutiæ found in larger text-books. But the book as it stands is one which can be confidently recommended to students and practitioners. It is clearly printed and it "opens" well. The phraseology throughout is refreshingly clear; new aphorisms and abundant pithy verbal illustrations are supplied, and the index is good.

A TEXT-BOOK OF SURGICAL DIAGNOSIS.

By Various Authors. Edited by A. J. WALTON, B.Sc., M.S., F.R.C.S. Two vols. London: Edward Arnold and Co. 1928. Pp. 1121. 63*s*.

THIS is an important book, being, we believe, the largest work on surgical diagnosis which has yet appeared from the English press. It is a composite effort, the editor having obtained the aid of upwards of 30 contributors, each of whom is an expert in the department of surgery of which he writes. There is one American name amongst them, whose inclusion prevents us from appraising this book as a purely British production. Allen B. Kanavel is known all over the world for his classical researches upon infections of the hand and his teaching has been everywhere accepted; no greater authority could have been chosen.

Volume I. deals with the diagnosis of inflammation, the specific infections, gangrene, shock, hæmorrhage, diseases of the limbs, cardio-vascular and lymphatic systems, head and neck. Contributors are Sir Lenthal Cheatle, Dr. P. N. Panton, Mr. Philip Turner, Mr. Seymour Barling, Mr. E. Rock Carling, Dr. P. Manson-Bahr, Dr. E. C. Hughes, Dr. J. H. Sequeira, Mr. David Lees, Mr. Russell Howard, Mr. H. S. Souttar, Mr. E. R. Flint, Mr. Harry Platt, Mr. H. A. T. Fairbank, Mr. James Driberg, Mr. R. Milne, Mr. Blundell Bankart, Mr. Timbrell Fisher, Mr. Geoffrey Jefferson, Dr. George Riddoch, Dr. W. E. Tanner, Mr. Norman Patterson, and the editor. Volume II. is concerned with the abdomen and thorax, and the contributors, in addition to some already mentioned, include Mr. Tudor Edwards, Mr. Zachary Cope, Mr. W. S. Perrin, Prof. D. P. D. Wilkie, Mr. Gordon Taylor, Mr. Lockhart-Mummery, Prof. S. G. Macdonald, and Mr. Victor Bonney.

The different sections are built up very much as in a systematic text-book of surgery. For instance, in the chapter on Injuries and Diseases of the Pancreas, injuries, calculi, acute pancreatitis, chronic pancreatitis, cysts and tumours of the organ are described with their characteristic histories and symptoms, and the similarity of the clinical pictures to that shown in other diseases is mentioned, as also any special laboratory methods of diagnosis and their value. Ætiology and pathology are discussed where they have a bearing on diagnosis. It is difficult for a writer to know how far to proceed in these directions without transgressing the legitimate scope of a treatise on diagnosis. The authors have without exception shown great judgment and discrimination in the inclusion or rejection of subject matter; throughout the book practically nothing irrelevant or redundant is printed. Mr. Walton in his preface refers to the tendency for operative treatment to outstep surgical diagnosis, and hopes that the volume will be of "real service to the busy practitioner and surgeon." It certainly will—but it falls short in two respects. The first is not a defect in the actual information given, most of which is excellent, but in the plan upon which the book is constructed. How will the busy practitioner who has a patient with a deformed hand, or an enlarged and bent tibia, or a tumour of the neck or orbit, for example, derive assistance from consulting its pages? He will find that he must first give the condition a name and then only will he be able to turn it up and see whether or not he is right in his surmise. The contracted hand of Dupuytren is in one section, two pages further on is a description of the hand in Volkmann's contracture, ten pages later appears an account of the claw-hand of cerebral diplegia; in a completely different section the claw-hand of ulnar paralysis is described, and in still another distant section are the deformed hands due to arthritis deformans or gonorrhœal polyarthritis to be found, these last two not even together but separated by 20 pages. Again, if the doctor suspects a bent tibia to be due to osteitis deformans he can turn up this section and confirm his suspicion, but he will have a difficult search to find any account of a bent tertiary syphilitic tibia, with which Paget's disease may be confused. These two simple examples show how an otherwise admirably written and informative book may fail to supply the needs of the diagnosing practitioner. How much better and more helpful is the regional method of writing a book on diagnosis is seen in sections such as those on the lips, jaws, mouth, and salivary glands, for example, where this system has been adopted.

The second point to which criticism may be directed is the lack of detail in the description of diagnostic measures. In such a large treatise, as large as many complete text-books of surgery for the student, reasonably full accounts may be expected. For instance, suppose the surgeon consults this book on the value of the indigo-carmine test in estimating kidney function. On p. 952 he will find that "with disease of the kidney the appearance of the colour may be delayed (or may not appear at all)," but he will remain in doubt as to how much delay after the "six or seven minutes" when it first appears is really significant of serious functional disease. Again, it would be difficult for anybody to use a sigmoidoscope from the account of "examination with the sigmoidoscope" (p. 630), and no adequate instructions as to how to carry out the manipulations necessary to diagnose a stricture of the urethra are supplied. On the other hand, the technique of thoracoscopy and œsophagoscopy are well described.

Apart from these two points the general standard of the work is uniformly high, no mean achievement where so many authors are concerned, and one which reflects great credit upon the editor. The book is well written, well printed, well illustrated, and accurate. It will no doubt appeal to a wide circle.

LOOKING ROUND, A MISCELLANY.

By Lord RIDDELL. London: George Newnes, Ltd. 1928. Pp. 190. 2*s*.

Lord Riddell, lawyer and journalist, employs a versatile and sympathetic pen to write 17 short essays on persons who have played prominent parts in the drama of public life. Some of these are alive to make their influence felt to-day; some are dead though not asleep; in one way or another each represents an influence. Three of the essays will

make particular appeal to medical men—namely, the biographies of Clemenceau, Huxley, and Sydenham. Of Clemenceau we learn that he comes of a race of doctors long resident in La Vendée, landowners as well, who "being of independent means did not charge for their services," a piece of philanthropy at the expense of the medical profession that was not exercised by Clemenceau himself while he was a Paris practitioner. Of Huxley Lord Riddell says, "Whatever power of accurate thinking or writing I possess I owe largely to him, a debt which hundreds of prominent workers without scientific training must have felt." In "A Medical Saint" we have a brief appreciation of Thomas Sydenham, "one of the five great medical saints" whom the author describes as "a sort of medical Bacon"; the other four saints whom he places in the medical hagiography being, of course, Harvey, Jenner, John Hunter, and Lister. Other personalities dealt with are those of Lord Balfour, Parnell, Sir William Joynson-Hicks, Lord Leverhulme, Lord Bryce, Sir John Simon, President Wilson, Lord Curzon, Augustine Birrell, Mussolini, and a little known mathematical genius, one Scrinivasa Ramanujan, F.R.S. In "A Mysterious Affair" the story is told of Sir Thomas Overbury's murder, which for 300 years has perplexed historians and lawyers. Lord Riddell's summing up of the contradictory evidence, in light of the no less contradictory theories of motive, leads him to suggest that King James was privy to the crime.

HYDATID DISEASE.

Its Pathology, Diagnosis, and Treatment. By HAROLD R. DEW, M.B., B.S., F.R.C.S. Eng., F.A.C.S., Hon. Surgeon to Out-patients, Melbourne Hospital; Jacksonian Prizeman, Royal College of Surgeons of England. Sydney: The Australasian Medical Publishing Company, Ltd. 1928. Pp. 429. 27*s.* 6*d.*

THE prevalence of hydatid disease in Australia has afforded special facilities to workers in that country for the study of its ætiology and treatment. Nevertheless, until comparatively recently, the diagnosis of this serious condition during life has been so difficult and the method of development of the hydatid cyst or the intermediate host so doubtful that an authoritative statement by such a well-known worker as Mr. Dew is welcome. We owe the recent advances in the study of hydatid disease principally to Dr. F. Dévé, of Rouen, and to Mr. Dew himself; others have contributed towards more accurate diagnosis by devising serological tests, amongst whom the name of Hamilton Fairley takes first place.

In this volume Mr. Dew deals with hydatid disease in the most minute and exhaustive manner, giving adequate references to each aspect of the subject. After passing in review the history of *Tænia echinococcus*, he writes on ætiology and prophylaxis with special reference to Australian conditions. There is no doubt that slaughter-yards and abattoirs in that country constitute important sources of infection. An enormous number of sheep are slaughtered annually in Australia for human consumption, and, since the incidence of hydatid disease in these animals is very high, a great number of viscera are rejected as unfit for human food, and some are eaten by dogs who have access to unguarded offal pits. Of all the British Dominions overseas New Zealand and Australia possess by far the greater number of sheep per head of population, the figures standing at 15·3 and 13·3 respectively. Mr. Dew's carefully compiled statistics of the distribution of hydatid disease in Australia will be read with interest; but of greater scientific importance is his account of the development of the cyst in the intermediate host and his interpretation of the various changes which take place within the cyst wall, a subject on which his views, founded on original work, have gained almost universal recognition. In Chapter VIII. are described the special diagnostic methods—by acupuncture, by serological tests, and by the intradermal reaction of Casoni—which help us to recognise the condition during life. A special chapter is devoted to hydatid anaphylaxis and ten others to a consideration of the clinical and pathological manifestations of hydatid cysts in various parts of the body. There are 87 illustrations, mostly original, and all excellent.

Manifestly this is a most thorough and excellent piece of work. Mr. Dew has produced a book which will bring credit to the great hospital to which he is attached.

Hydatid Cysts of the Lung of Children. By M. H. VEGAS, M.D., F.A.C.S., F.R.S.M., Hon. Professor and Member of the Academia de Medicina de Buenos Aires. Buenos Aires: S. A. Imprenta Lamb y Cia, Ltd. 1928. Pp. 300.

THIS brochure, which is dedicated to the American College of Surgeons, deals with a study of hydatid cysts occurring in children. In Argentina, where echinococcus is unfortunately very common, the author has been continuously engaged on this study since 1893. Out of a total of 25,000 children's histories recorded in his archives there are 50 of hydatid of the lung, practically all of which were operated upon by the author himself. Unfortunately, Dr. Vegas has had great difficulty in obtaining access to Australian publications in Argentina with the result that the original work of H. R. Dew and N. Hamilton Fairley has not reached him, and consequently his description of the development of the hydatid cyst differs considerably from the modern view. This matters less in that the chief interest of his book centres upon treatment; the operation of thoracoplasty, as performed by the author, is discussed in detail. A great portion of the work is occupied by details of illustrative cases, which take up over 100 pages, and by a bibliography referring to Argentine publications on hydatid disease.

ASPECTS OF AGE, LIFE, AND DISEASE.

By Sir HUMPHRY ROLLESTON, Bart., K.C.B., M.D., Hon. D.Sc., D.C.L., LL.D. A volume in the Anglo-French Library of Medical and Biological Science. London: Kegan Paul, Trench, Trübner, and Co., Ltd. 1928. Pp. 304. 10*s.* 6*d.*

THIS book, by the Regius Professor of Physic in the University of Cambridge, forms one of a series now being published, in both languages, in the Anglo-French Library of Medical and Biological Science, under the general editorship of Dr. F. G. Crookshank (London) and Prof. René Cruchet (Bordeaux). Sir Humphry Rolleston here reprints 13 papers which have appeared at various times within the past few years in different journals, and has taken the opportunity of making a few additions and amendments. Most of these papers will be familiar to our readers, but it is convenient to have them collected together into one handy, well-printed volume. We are not sure whether it was, or was not, Sir Humphry Rolleston who originated the dictum that when a medical man begins to write on the history of his subject it is a sure sign of senility. The historical papers in this book show how interesting the study of medical history can be made to the average medical man by a master hand; if indeed this skill be a sign of senility we hope that Sir Humphry will long continue to enrich the literature of our profession with like signs. Apart from the historical side, exemplified in the papers on old age, clinical variations in disease from the historical standpoint, and the paper on Samuel Johnson, Sir Humphry is at his best in such subjects as the medical aspects of holidays, poetry and physic, professional careers, and the changes in the clinical aspects of disease. Those of his old pupils who have attended his museum classes and have been his clerks and house-physicians will be glad to have in their possession a volume wherein the philosophy and catholicism of their master is so well exemplified. The book will also appeal to a wide circle outside the profession. The literary output of Sir Humphry has been great; but this little volume of collected addresses will enhance his reputation as a scholarly physician.

THE LANCET.

LONDON: SATURDAY, JANUARY 5, 1929.

THE KING'S ILLNESS.

THE New Year brings but little lessening of the concern with which the KING's illness is watched both in this country and elsewhere. The path to convalescence has proved steep and difficult; almost too steep, indeed, for a man exhausted by so many weeks' infection. Its dangers have been only too apparent, and that many of them have still to be surmounted is clear from the cautious bulletins of HIS MAJESTY'S advisers. The news they contain is amplified in the following statement which has been drawn up for the information of the medical profession:—

"For true understanding of the position it must be emphasised that neither in its inception nor in its subsequent course has this illness conformed to what is called 'pleuro-pneumonia'; rather was it a streptococcal septicæmia which by fortunate happening localised at the base of the right lung, first imperfectly and later as an empyema ('fixation abscess') forming between the base of the lung and the diaphragm. In the second phase of the illness [vide report in THE LANCET of Dec. 22nd, 1928] the clinical picture—dusky appearance, dry cracked tongue, delirium, subsultus, exhaustion—was that of a severe toxæmia and resembling that of a case of severe typhoid fever in the third or fourth week. So now, the picture is that of the aftermath of a severe general infection. The empyema wound is now clean and steadily diminishing in size, the discharge from the pleural cavity is small in amount, and the streptococcus grown from the pus (identical with that originally found in the blood) is diminishing in potency. Eusol has been an effective local application, and though through the courtesy of an American colleague, Dr. Sherman, of Pittsburgh, a supply of Dakin's solution, electrolytically prepared, has been recently received, there has been no opportunity to use it because the necessity of any such local application has passed. On the other hand, the disinclination for food and the dryness of the tongue, the low blood pressure, the weakness and wasting, the notable exhaustion, though slowly improving, will for long be an anxious problem. It will be readily understood that while this exhaustion state is pronounced, the margin of reserve power must be narrow and that small setbacks, inevitable at this stage, have a correspondingly more severe effect. It is important that the public should not interpret such setbacks or reports of 'no change' as relapses. During each week there will be ups and downs, and progress will consist of a slow and increasing predominance of the ups over the downs. One of the inevitable difficulties in so long an illness is to convey to the public a true picture—neither too bright nor too dark. It is for this reason, amongst others, that the courtesy of the medical press is valuable in order to convey, through their readers to the public, fuller information and so avoid the risk of misunderstanding. As regards nourishment, about which so many suggestions have been received, the difficulties will be understood when it is stated that there is disinclination for most foods and dislike for many, and that weakness necessitates that nourishment be given by a nurse with a feeder. Adequacy of nutriment both as regards quantity and variety is now being secured, though not without difficulty. Moreover, the combating of loss of weight, which has been notable, depends not only on food taken, but food digested and assimilated, and here again the exhaustion tells its tale. The blood pressure has fallen too low, and the calcium content of the blood has of late considerably decreased. The administration of calcium, parathyroid extract, and strychnine is apparently beneficial. The same is true of ray-therapy, which is being continued. It need hardly be stated that the question of transfusion has received full consideration. In an illness of this complicated character the indications for transfusion must be clear, and it must be remembered that with the most skilled procedure its employment would in this case entail risk. The striking results following transfusion—e.g., in cases of anæmia due to either hæmorrhage or infection—are apt to lead to its employment in other conditions without adequate consideration of the pros and cons. It is sufficient to repeat that in this grave illness it has been fully considered and put aside at the present stage as definitely undesirable. Moreover, the red blood count is one of the most hopeful features, for whereas in the early days of the illness the red count was as low as 2,900,000, to-day the count reaches 4,300,000. Moreover, the exhaustion is as much a weariness of mind as of body. Though there is an increasing sense of the burden of his illness, the will of the KING to live is there. Because of the exhaustion the course must be long and for the present anxious. None the less improvement and progress are taking place slowly, but surely enough to justify the hope that the KING will be restored to his people."

The note of encouragement with which this statement ends will do much to renew a hope which has at times fallen very low. On the other hand, the obstacles to recovery are frankly set out, and no medical reader will gain the impression that their removal is purely a matter of time. Though there is increasing reason to think that the preservation of the KING's life during these many weeks will not have been in vain, a more definite and settled improvement is unfortunately needed before our anxiety can be replaced by confidence.

HIGH-FREQUENCY CURRENTS IN INTRACRANIAL SURGERY.

WHAT is probably the first attempt on a large scale to use high-frequency electrical currents in intracranial surgery has recently been made by HARVEY CUSHING,[1] and the preliminary results are very promising. In this work CUSHING has had the assistance of that brilliant physicist, W. T. BOVIE, who has provided an apparatus that furnishes a current of 1 million to 3 million alternations a second. By modifying the current in various ways it is possible to produce various different effects upon living tissues, the most important being superficial dehydration, cutting, and coagulation. The apparatus can thus be used to incise the brain and to remove whole tumours or portions of tumours without bleeding, to seal bleeding points, and to bring about massive coagulation of large blood-vessels. The effects depend, as BOVIE points out, "upon the heat developed by the current in passing from the active electrode *into* the tissues, or upon the ohmic heat developed by the current in passing *through* the tissues."

Surgical diathermy or endothermy, as it is called,[2] has hitherto been used almost entirely for the removal of malignant tumours, and one of the chief advantages claimed for it has been the destruction of outlying malignant cells that might escape and seed

[1] Surg., Gynec., and Obstet., 1928, xlvii., 751.
[2] See THE LANCET, 1927, i., 1031.

themselves into the remaining tissues if the operation was performed by scalpel. CUSHING seems to have begun using BOVIE'S machine with this idea, but after a few experiences with malignant tumours he realised that the chief merit of the method for his purpose was that it could cut bloodlessly and without pressure. Accordingly he proceeded to attack large encapsulated vascular meningiomas on the base of the brain—tumours which from their extreme vascularity and inaccessible position had hitherto defied all, or almost all, attempts at successful removal. A large meningioma arising from the olfactory groove and growing upwards into both frontal lobes was encountered at operation; only a small part of its surface could be exposed; but by means of an active ring-shaped electrode it was possible to remove bloodlessly loopfuls of the interior of the tumour—"scalloping," CUSHING calls it—until the shell began to collapse so that it could be taken away entire without any more traction or pressure on the surrounding brain than had been required for the original exposure. This process of piecemeal removal of meningiomas proved tedious and led to operations lasting as long as nine hours; but the results of a series of cases show that a very definite advance has been made. Since the introduction of the BOVIE apparatus two years ago CUSHING has completely removed ten large meningiomas of the olfactory groove with only two deaths, and these among early cases of the series. No longer, he shows, is it necessary to attempt enucleation of these tumours, or of similar growths in other parts of the brain, at the expense of laceration and severe retraction of the surrounding tissue. His next move was to try the effect of electro-surgery on the angiomas—tumours consisting of a congeries of large blood-vessels, whose removal by older surgical methods has usually led to fatal hæmorrhage—and he found that by treating the surface of the tumour with a highly damped desiccating current enough thrombosis was induced to make removal possible at a second operation one or two weeks after the first. In several cases total enucleation of gliomas of the fourth ventricle and vermis was delicately and successfully carried out. Further advances were also made in the treatment of acoustic neuromas.

This work of CUSHING and BOVIE marks a notable advance in intracranial surgery, and it will also arouse a desire for more knowledge of the interactions of electrical currents and living tissues. Thus it may have results that will be of great value not only in the treatment but also in the diagnosis of disease.

THE VIRTUES OF MILK.

ON another page appears the second report of the Scottish Board of Health's inquiry into the dietetic value of milk. It confirms and extends the results published last January,[1] for at all seven centres of investigation the groups of children receiving milk showed a gain in height and weight much greater than that of their contemporaries who got a biscuit ration of the same caloric value. The improvement in the general health was such that the groups of children receiving milk could be picked out merely by inspection. The good effects of adding milk to the diet were, indeed, even more obvious in the period covered by this second report than they were in the previous period, and it was significant that the improvement was mental as well as physical. Dr. C. A. DOUGLAS says that "general alertness was common to all the children fed on milk. . . . It was gathered from teachers and janitors that the children receiving milk were much more alert and very much more boisterous and difficult to control than the others." Another notable result was that with one exception no great difference was observed between the groups getting whole milk and those getting separated (skimmed) milk. This is convincing evidence of the high nutritive value of skimmed milk, but it would be a mistake to conclude from these observations that the part is as good as the whole, and no such conclusion is drawn by the investigators. The conditions of experiment did not permit of an absolute comparison between whole milk and separated milk, for the ration of milk and biscuits was given in supplement to what the children were already having at their own homes. The home diet was an unknown factor in the experiment, and the extent of its deficiencies must necessarily determine the extent of the improvement seen in the milk groups. If, for instance, the home diet included leafy vegetables or butter or a margarine containing vitamin A, the addition of separated milk would probably be nearly as efficacious as the addition of whole milk. Moreover, though height and weight are obvious and measurable criteria of good health they are not the only ones. Another important manifestation of health is the power to resist disease, and here we have good reason to think that even comparatively slight dietetic deficiencies, if sufficiently prolonged, will predispose to infections which find an entry through the mucous membranes of the respiratory and intestinal tracts. The importance of the dietetic factor in determining the resistance to infection may indeed be greater than is at present suspected, and it would considerably add to the value of the Scottish investigation if subsequent reports gave detailed information on the clinical history of the different groups of children.

In commenting on the first report of this investigation we pointed out that the results obtained by addition of milk to the dietary are neither new nor astonishing; nor is such a claim made by those who are conducting it. Two years ago Dr. CORRY MANN published an account of an inquiry on the same lines which gave the same results. In the following year we published a paper[2] in which Dr. W. CRAMER emphasised the exceptionally high dietetic value of milk. He calculated the daily requirement per head as being about two pints—which may, of course, be consumed either as such, or in the form of butter and cheese—and he showed that in this country the actual consumption is far below this figure so far as a great part of the population is concerned. The same view was forcibly expressed by Sir GEORGE NEWMAN in his annual report for 1927. An American authority on dietetics, Prof. E. V. MCCOLLUM, speaks of milk as a "protective food" and arrives at the same figure as Dr. CRAMER for the minimal daily requirement. The fact that in the Scottish investigation the addition of one pint of milk to the diet produced so striking an improvement confirms incidentally the contention that large classes of the population suffer as a result of taking too little.

This reminder of the unique dietetic value of milk comes at an opportune moment. The distress in the mining areas of South Wales and Durham necessarily involves the risk of undernutrition in large numbers of the population, and it is of paramount importance that the funds collected for relief, in so far as they are expended on food, should be spent wisely and economically. The problem is to construct a palatable dietary which satisfies the dietetic requirements at the minimum of cost. Obviously the solution of this problem cannot be difficult, for it is a fundamental

[1] THE LANCET, 1928, i., 202.

[2] Ibid., 1927, ii., 774.

economic problem which the bulk of civilised mankind has always had to face, and it must have been successfully solved by generation after generation. Now it is the dietetic experience of civilised man that a dietary is sound both from the economic and from the physiological point of view if it is built around a basis of cereals and milk. There is nothing in our recent knowledge of dietetics which runs counter to this practical experience. On the contrary, research has justified it. It has also enabled us to understand that in this simple form of dietary the whole cereal cannot be replaced by some refined product obtained from the cereal. In this country cereals are consumed mainly as wheaten bread. The more the caloric requirements of a dietary are covered by bread the more important is it that all the bread eaten should not be white bread, and that at least some of it should contain an adequate admixture of germ or its equivalent. Milk can be consumed either as such or in the form of butter and cheese. Unfortunately, the use of whole milk and of butter is expensive, but the results of the Scottish investigation justify the replacement of whole milk by separated milk provided that a brand of margarine containing vitamin A is used to replace the butter. A dietary, therefore, of porridge, brown bread, separated milk, margarine containing vitamin A, and cheese, would cover almost all nutritive requirements at the minimum of cost. It only requires to be supplemented by the addition of a small amount of fresh vegetable food to make it an adequate diet. If in the distressed areas a basal ration of porridge, bread, one pint of separated milk per head, and an ounce of margarine containing vitamin A were distributed, it would protect the people against most forms of undernutrition; and although in itself such a diet would not be adequate in every respect it is probably better than those on which, from ignorance, a large part of the people of this country now live. On the basis of such a dietary it would be possible to calculate almost to a penny the cost of supplying the distressed areas with food, so that the public and the Government could then appreciate the extent of the task with which they are faced. If the available funds are inadequate to meet the cost it should at any rate be applied to the children and to the nursing and expectant mothers whose health would suffer most from undernutrition. A scheme of this kind recommends itself not only as a measure of properly regulated charity, but also as one of wise economy. For the effects of extensive undernutrition are certain to lay a lasting and heavy burden on the community in the shape of permanent disablement and disease.

THE FUTURE OF GENERAL PRACTICE.

AT almost every hospital dinner someone says amid applause that the general practitioner is the backbone of our profession. Is this only an ancient form of words or does it express a faith alive enough to breed action? The question needs an answer now if ever, for a vague irresolute opinion will do nothing to govern events. General practice is losing its place of first importance in medicine and unless it is regenerated and supported there will be fundamental changes in the structure of the profession as a whole.

The medical needs of the public are always enlarging and varying. At the time when this journal was founded they were mostly fulfilled by a single person, the family doctor; whereas to-day we see a vast machinery of hospitals and public health organisations set up to supplement his efforts in healing and preventing disease. Their work is sometimes said to "encroach" upon his practice, and so indeed it does. But it has all arisen because, for one reason or another, the community could not get from him the care and teaching it wanted. If tuberculosis, infant welfare, venereal diseases, and much of general medicine and surgery have been diverted to clinics and hospitals it is because—from the social point of view—the private practitioner has not been able to cope with them effectively. Sometimes people cannot pay his charges; sometimes they must have institutional care of a kind he cannot given them; sometimes they want more time than he can spare in the daily round; and sometimes they need a skill he does not possess. It has become impossible to unite in one man anything like a complete knowledge of modern diagnosis (let alone treatment), and the public must have, beyond the family doctor, the services of men who have made a study of pathology, radiology, neurology, and psychology—the eye, ear, nose, throat, teeth, and many another specialty Where the poor are concerned society has made arrangements for the care of infectious fevers, insanity, mental deficiency, physical deformity, and a host of other conditions; some of the big industrial firms are taking it upon themselves to look after the health of their employees; and even in the middle and upper classes the scope of general practice is steadily contracting. Many patients like to be treated at hospital rather than at home for their acuter illnesses; parents subscribe to clinics where they can get specialist advice about bringing up their babies; and there is a widespread feeling in favour of the expert as opposed to the merely benevolent. Some say, therefore, that it is the fate of the family doctor to become a sort of shopwalker who will send his patient promptly to the right department and disclaim personal responsibility for knowledge. While agreeing that this may well happen unless steps are taken to stop it, we believe that such a degradation of his functions would be against the public interest. The specialist, like the laboratory, is a good servant but a bad master, and what the average man chiefly needs is a doctor who will shoulder full responsibility for his treatment and take over the burden of his difficulties when he can no longer meet them. He wants someone who will look after *him* rather than his disease, and for this purpose he is best in the hands of a man he knows and who knows him and his surroundings. The hospital may offer skilful nursing and apparatus of investigation; the specialist is indispensable; but neither is the best kind of guide during the indefinite periods of ill-health which are the constant lot of many working men and women. The family doctor can do more than either to influence the daily life of those in his charge, to see that the children are properly nourished and are growing up with no removable handicap to ensure that pregnancy and childbirth shall follow a normal course—in short, to introduce the spirit and practice of preventive medicine into the home.

If it is accepted that general practitioners ought to keep the chief responsibility for the diagnosis, treatment, and prevention of disease—that they should remain the backbone of our profession—we may well ask what equipment and opportunity they are given for holding their own in face of the growing demands of the public. This is not perhaps the time to discuss the whole subject of education, fees, hours of work, holidays, and post-graduate teaching, but it is emphatically the time to consider whether general practice is to lose or gain its life from the legislative changes now approaching. Having suggested that the ideal practitioner should have a good knowledge of diagnosis and treatment, together with an informed

enthusiasm for public health, we are forced to admit that the present system does much to prevent his having either. The young doctor may leave his teaching hospital with a determination to keep up with advances in technique; is it to be certain of his doing so that we make it hard for him to get appointments at his local hospital? He may wish to learn all he can (say) of infant hygiene, antenatal work, tuberculosis, venereal disease and other specialties; is it to ensure that he shall be competent as a practitioner, and shall be imbued with an interest in preventive medicine, that we reserve most of the posts in the public health services for whole-time workers? All this is done in the name of efficiency; and doubtless it is true that a public health department is most easily run by public health officials alone. At the same time experience shows that private practitioners can be successfully enlisted to do this work, and the ultimate advantage of such a plan is beyond all question. Much talk is heard about good feeling between medical officers of health and doctors in their neighbourhood, but the only kind of coöperation that will weld the medical profession, as at present constituted, into a single and efficient instrument, is the coöperation by which young men in private practice are given a large part in working the public services. It ought to be the rule that all those who join a firm as assistants or junior partners should take appointments at the municipal clinics and treatment centres of the locality. At first they would act as clinical assistants and later would hold more responsible posts, their time being adequately paid for on the understanding, of course, that they will look on their public work as taking precedence, during hours of duty, over private interests. Results would eventually justify this policy over and over again, but its adoption needs long foresight. Unluckily, even where well established, it is likely to be put to a severe test during the next few years, for more and more of those who sit on county and borough councils will be in favour of having an easily directed staff of whole-time officers. We shall see an attempt, in the name of symmetry and efficiency, to develop municipal medical services divorced from private practice except in so far as they control and limit it. As a corollary we shall probably see the poor-law hospitals, when they are made over to municipalities, staffed as far as possible by whole-time physicians and surgeons; and if this is done the golden chance of regenerating general practice will be lost. Nothing could be simpler than to set up a hospital service under the public health authorities—a service self-sufficient and self-contained. But to do so would be to condemn the private practitioner to an increasing obsolescence. Without access to hospital for his patients, without facilities for diagnosis or contact with his colleagues, no medical man can properly do the difficult work that is required of him. On the other hand, cottage hospitals up and down the country have shown what can be done by bringing doctors into touch with one another and by offering them better chances of investigating and treating their cases, and we are convinced that to give private practitioners the main part in looking after patients in the municipal (lately poor-law) hospitals would do more than anything else to raise the level of medical practice in this country. To close the doors against them—however convenient and economical this may prove—will be a grave blunder unless it is truly desired that the public service shall ultimately take over all their important duties. The general practitioner can either be brought into the scheme of things or crowded out of it. He can either be doomed or redeemed.

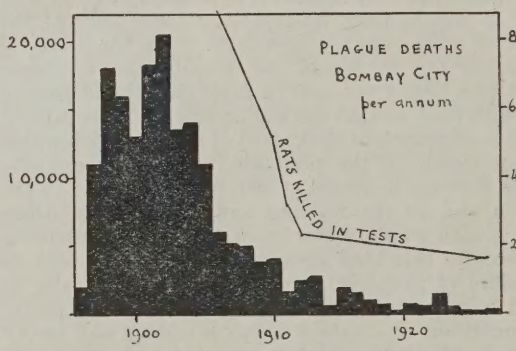
Annotations.

"Ne quid nimis."

MASS IMMUNITY.

MAN'S resistance to infection may be of three kinds: (1) natural immunity (e.g., distemper), inherent in the constitution of the species or subspecies; (2) mass immunity (e.g., measles) acquired by a population having been exposed to the infection in the past and a resistant race having been selected out; (3) individual immunity (e.g., small-pox) from an obvious or suppressed attack or from artificial inoculation. The last two forms almost necessarily overlap in human experience and individual resistance is superadded to a greater or less degree of mass immunity. The resistance of men to any infection no doubt varies just as their every other measurable quality varies. Most individuals have something near the average immunity, some are very susceptible, some very resistant. These qualities are heritable and the progeny of the survivors of any epidemic will be on the whole more resistant than the population in which the epidemic impinged. According to the intensity, duration, and frequency of epidemics the population will become more and more resistant. Such, at any rate, seems likely, though it is hardly possible to prove from human experience alone, that this process actually operates.

Progressive selection by an infection should be easier to demonstrate in small animals: first, because they breed quicker and many generations may come within individual human experience; secondly, because in them sickness generally means death and in consequence the surviving population is not diluted with the offspring of survivors who have acquired individual immunity which is not inherited. Selection under



wild conditions is presumably more intense than when it is interfered with by nurses and doctors, and it seems that a very clear selection of this type has taken place among the rats of Bombay City since plague broke out among them 32 years ago, as may be learned from the very interesting account given by Lieut.-Colonel F. P. Mackie, I.M.S., in the report of the Haffkine Institute for 1927. Plague was introduced into Bombay in 1896 and assumed severe epidemic proportions in the following year. During each of the next seven years from 13,000 to 20,000 people died. After 1905 there was a rapid decline which has gone on progressively and almost regularly till the human deaths in 1926 and 1927 were only 56 and 207. There is no means of measuring with any accuracy the extent and intensity of the corresponding rat epidemics, but it is reasonable to suppose that they have run fairly parallel with the human outbreaks. During this period the resistance of wild Bombay rats to artificial inoculation with plague bacilli has been measured from time to time, with the striking results shown in the table. The conditions of such experiments can scarcely be sufficiently standard to justify minute numerical analysis, but the broad conclusion seems plain—that a given dose of bacilli will now kill only one-fifth of

the number of rats which it would have killed at the beginning of the century. The experiments made in 1910–12 and in 1926–27 have all been controlled by inoculating simultaneously an adequate sample of wild rats from Madras City where plague has never gained a foothold; 95 to 98 per cent. of this unselected

Year	Percentage dying from the test dose of plague bacilli.	Animals tested.	Year	Percentage dying from the test dose of plague bacilli.	Animals tested.
1904	93	111	1912	24	300
1906	95	577	1926	18	848
1910	54	648	1927	18	1407
1911	33	1200			

population died from the test dose. It was also shown by the Advisory Committee in 1910–12 that the young rats bred in captivity from wild Bombay rats were as resistant as their parents.

The present condition has been achieved by 32 epidemics; it is not much different to the position in 1912 after 16. Just how often rats breed in nature is unknown—probably two or three generations a year—and as plague epidemics are annual some generations would escape selection. Roughly speaking, one may judge that immunity is about doubled in 30 to 40 generations. In man this would mean about 1000 years, and as a matter of fact the time has come only lately when any such mass immunity to plague in the people in India might be expected to begin to have an effect. It will be a matter of the most intense epidemiological and biological interest to see whether, after plague has finally died out, the Bombay rats continue to be resistant or whether they will gradually deteriorate to the level of their cousins in Madras.

CRANIAL AND INTRACRANIAL HÆMORRHAGE IN INFANTS.

THE relation of cerebral birth-injury to the nervous diseases of childhood is a problem which remains as controversial as ever. The attempt to correlate the results of autopsies on infants dying of cerebral hæmorrhage with the signs and lesions of children suffering from spastic disorders has so far accomplished little, and the whole question is still in the realm of speculation rather than established fact. Further progress is most likely to come from following up cases which have been thoroughly investigated at birth, and Dr. Donald Munro,[1] of Boston, has lately described an attempt of this kind based on 117 cases over a period of seven years. Whilst his paper includes some objective observations which are of great interest and value, the reader is likely to be impressed by the extreme difficulty of the whole question, and will be wise to adopt an attitude of caution in interpreting the results in terms of causation. The series comprises cases in which a diagnosis of cranial or intracranial damage, including œdema, was made, the basis of the diagnosis being an increase of cerebral pressure (in the absence of surgical shock), in conjunction with such symptoms as cyanosis, refusal to suck, hypertonus, and respiratory abnormality. Of the total 117, no fewer than 54 were first-born infants. Fifty-six died of immediate effects, whilst 58 were discharged as relieved or improved. At post-mortem macroscopical examination hæmorrhage was found in the great majority of the fatal cases, but congestion and œdema alone were found in others, these corresponding to the ones that Munro classified during life as "asphyxial" rather than traumatic. On microscopical examination, however, the asphyxial cases also showed evidence of hæmorrhage, which was usually intra-cortical. The gross traumatic lesions were most often found in the vena magna Galeni or the lateral sinus. Of the 58 babies discharged, all but ten were traced up to December, 1927. Eleven had died, including three with hydrocephalus and one with spastic idiocy; the other seven died of some intercurrent disease. Of the remaining 37, 25 were normal at the end of 1927; 9 were normal when last seen, and 3 suffered from hydrocephalus or convulsions. Munro has presented his results in the form of tables in which the various clinical types are compared, and his deductions depend somewhat closely on this classification. It is to be feared that this fact will increase the difficulty of correlating his painstaking work with that of other investigators. Cases are divided into three groups—traumatic, asphyxial, and hæmorrhagic. He assumes that asphyxia is a cause of hæmorrhage, explicitly attributing one group (16 cases) to it, and therein he may be accused of begging an unsolved question. The assumption is one which most of his fellow workers would probably not accept, for the exhaustive reviews which have appeared in recent years—notably the monographs of H. Ehrenfest and F. R. Ford—indicate that the balance of opinion is opposed to accepting asphyxia as a causal agent, though it may be predisposing or contributory. Moreover, the experimental work on kittens done by Ford, to which we drew attention last year[2] cannot fail to strengthen scepticism about this alleged causal factor, and Munro's figures would have had greater value if so doubtful a major premise could have been eliminated. Of the positive findings in the surviving cases, the outstanding feature is the incidence of hydrocephalus. One of the author's conclusions is that "the most common late result of cerebral damage in the new-born is hydrocephalus associated with either epilepsy or idiocy." The possibility of the hydrocephalus being a late result of a prenatal defect should not, however, be overlooked, and that this is usually so is the considered opinion of W. E. Dandy, Ford, and many other authorities. On the other hand, Munro's view is supported by John Fraser and Norman Dott, who believe that intracranial hæmorrhage plays an important part in the ætiology of hydrocephalus. We hope that in his next communication Munro will deal fully and critically with some of these interesting questions of cause and effect.

[1] Surg., Gyn., and Obst., November, 1928, p. 622.

FILARIASIS IN OCEANIA.

A MEMOIR, by Dr. P. A. Buxton, on a research expedition into Samoa, Tonga, the Ellice Group, and the New Hebrides in 1924–25 was published in July, 1927. This memoir was principally concerned with the entomology of these lands. He has now published a study[3] of filariasis as it exists in Oceania. In his general scheme of study of filariasis in Samoa and adjacent island groups Dr. Buxton has pursued the methods used by his predecessors engaged upon the same work in that area, but his statistics are more searching and have been calculated on more strictly mathematical lines. Filarial infection in Oceania is rare in childhood. From the age of 11 its incidence rises steadily, and in Samoans reaches 50 per cent. in the age-group from 26–35 years. No constant difference is found in the microfilarial count between those males with, and those without, enlarged epitrochlear glands, and there is no consistent difference in count between communities in which the epitrochlear rate is high, moderate, or low. In other words, *Filaria bancrofti* either produces embryos in the blood and no epitrochlear gland enlargement, or it produces an epitrochlear enlargement, but its microfilariæ fail to reach the blood stream. The glandular signs of filariasis increased with age. Enlargement of the epitrochlear gland was observed in 48·5 per cent. of Samoan males otherwise normal.

[2] THE LANCET, 1928, i., 665.

[3] Researches in Polynesia and Melanesia. An account of Investigations in Samoa, Tonga, The Ellice Group, and the New Hebrides in 1924–25. Parts V.–VII. (Relating to Human Diseases and Welfare). By Patrick A. Buxton, M.R.C.S., D.T.M. & H., formerly Milner Research Fellow; Director, Department of Entomology, London School of Hygiene and Tropical Medicine. Published by the London School of Hygiene and Tropical Medicine. 1928. Pp. 137 and plates. 9*s*.

Myositis, with multiple abscess formation, which is common amongst the Samoans, but absent in the Ellice, Tokelau, and Gilbert Islands, is not regarded by the author as of filarial origin. Amongst the genital signs of filariasis are marked fibrosis of the testes, epididymiitis, and hydroceles, which are commonly antecedents of elephantiasis in scrotums. Allowing for all the difficulties attendant on the proper study of filariasis, the author concludes that filarial infection is an essential precursor to elephantiasis, but that the exact position of the filaria itself in the pathology of the disease is obscure, at least in Oceania. The common filarial infection of tropical Asia, due to *Filaria bancrofti* with a nocturnal larva, extends eastward and prevails in New Guinea and throughout Melanesia, but the insect vectors in these regions are unknown. In Fiji and Polynesia the filaria with non-periodic larvæ is found, and throughout its area the vector is *Aëdes variegatus*. Certain facts probably account for the absence of the periodicity of microfilaria east of long. 170° E. Even where the microfilaria is nocturnal, the periodicity is not absolute, and a few larvæ may be found in the blood during the day; and it is probable that the non-periodic habit is in some way influenced by the presence of *Aëdes variegatus* in the islands east of long. 170° E. This particular line is of importance in the œcology of the Pacific. West of it the people are Melanesian, malaria prevails, and the microfilaria is non-periodic. Filariasis in Samoa resembles that of Fiji closely, especially in the rarity of lymph scrotum, lymphuria, and chyluria.

Dr. Buxton is to be congratulated on having brought to a successful conclusion a fine piece of work which, in addition to much valuable material, provides matter for further reflection. He deals not only with filariasis, but also with yaws, leprosy, dysentery, and helminthic diseases as seen in Samoa. Part VII. of his monograph is concerned with brown man and white in Samoa, and is an anthropological study of considerable ability, giving an outline of history, customs, and communal life of the people.

CHRONIC APPENDICITIS.

CHRONIC appendicitis is evidently as big a problem in America as it is here, if two recent papers may be taken as a guide. Andresen's [1] conclusions are based on an analysis of 3500 gastro-intestinal cases, and he deplores the results of "misdirected enthusiasm" for unnecessary and ill-directed surgery which has resulted in "thousands of individuals who have not been benefited by appendicectomy." His view is that the structure of the normal appendix (its cilia, its musculature, and the valve of Gerlach at its outlet) is such as to prevent the entry of cæcal contents. Thickening of the wall by inflammation interferes with normal function, cæcal contents enter, and the efforts of the appendix to expel the irritating mass formed by stagnation and desiccation may be the cause of so-called appendicular colic. The appendix does not live for itself alone, and as a rule "chronic appendicitis is only a part of a generalised chronic infection of the whole gastro-intestinal tube and its appendages." In Andresen's series of 586 cases lesions of other organs were demonstrable in 556—that is, 95 per cent. The frequent association of infected tonsils and teeth with chronic disease of the appendix is noted, and also the rarity of concomitant pelvic foci in the female. Diagnosis is difficult, for the symptoms are not characteristic and are readily masked by those arising from the frequent coexisting infection. Similarly, Andresen points out that physical examination is often misleading, and this is undoubtedly true, though we do not think it applies to palpation of an appendix seen on the X ray table. He doubts whether a normal appendix will fill with a barium meal, though it may with an opaque enema, but here again the statement must be qualified, for E. I. Spriggs and O. A. Marxer have shown that if buttermilk is used as a vehicle for the meal, after careful preparation, appendices will fill which otherwise appear impermeable. While reference is made in Andresen's paper to the significance of delay in emptying of the appendix, spasm is not mentioned, though it is a valuable sign, especially if occurring early; the indirect evidence gained by radiographic examination is carefully considered. The general conclusion reached is "that a diagnosis of chronic appendicitis does not necessarily mean . . . an operation." Medical treatment is general (treatment of any coexistent infection or foci) and local. The latter includes dieting with "a normal rough diet" to stimulate the cæcum, meat being taboo; mineral oil is used if required, and general hygienic measures are taken. Such treatment he regards as efficacious and would limit surgery to complications such as kinks and adhesions. Carnett and Boles [2] agree with Andresen about the number of useless operations and in regarding the appendix as only one factor at fault, for they find a constitutional element in many of their cases. The chronic changes seen in the appendix seem to them largely due to a normal evolution and not to disease. Mistakes, in their opinion, arise from confusion of parietal with visceral pain, for they place much of the so-called appendix pain and tenderness in the abdominal wall itself, attributing it to an irritative lesion of the lower intercostal and first lumbar nerves, secondary, as a rule, to a spinal arthritis or malposition. Non-operative treatment is advocated, particularly orthopædic supervision of the vertebral column and adjacent parts. "Patients as a whole would be better off by complete abandonment of appendicectomy for so-called chronic appendicitis." The views reflected in these two papers seem then to be as follows: diagnosis is difficult, treatment must not be limited to the appendix, many useless operations are performed, and there is no one indication on which the surgical result can be foretold. With these views we agree, but would add that cases do occur in which a simple appendicectomy relieves the symptoms. The difficulty lies in recognising such cases.

[1] Medical Aspects of Chronic Appendicitis, by Albert F. R. Andresen, Amer. Jour. Surg., October, 1928, p. 372.

THE NEW FOOD AND DRUGS LEGISLATION.

WHAT used to be known as the Sale of Food and Drugs Acts, 1875 to 1927, were repealed last summer (together with certain amending provisions such as, for instance, those contained in the Milk and Dairies (Consolidation) Act 1915) and superseded by the Food and Drugs (Adulteration) Act, 1928. The new Act takes effect as from the beginning of the year 1929, and will be found a convenient statement of the law in the form of a single orderly document. Two points perhaps should be emphasised in respect of it. In the first place, for drafting reasons, the new Act labels the local authorities which have to administer its provisions as "food and drugs authorities"; the officers who are empowered to take samples are labelled "sampling officers"; these are merely verbal alterations; in other respects there is no change in the law. The second point is that, as usual in a consolidating statute, the repeal of the older enactments is not to have the effect of repealing the regulations made thereunder. This means that the Public Health (Preservatives, &c., in Food) Regulations made by the Minister of Health in 1925 and subsequently amended in 1926 and 1927 are still in force though in part made under the Acts now superseded. These Regulations have also now been printed in the form of a single consolidated document, but there are passages which read awkwardly because of references to the repealed Acts. It would have been preferable to reissue a new code of Regulations without these difficulties even if the awkwardness is not serious. For instance, when Article 6 of the Regulations says that the Sale of Food and Drugs Acts, 1875 to 1907, shall apply to a sample, the reader has to make a

[2] Fallacies concerning Chronic Appendicitis. By John Berton Carnett and Russell S. Boles. Jour. Amer. Med. Assoc., 1928, xci., 1679.

mental substitution and remember that it is now the 1928 Act which is to apply. And, when the Regulations go on to say that Section 14 of the 1875 Act and Section 13 of the 1899 Act shall apply to an analysis, it is now Section 18 (1) of the 1928 statute which is applied.

The Ministry has issued to food and drugs authorities a memorandum on the procedure under the Act explaining the formal differences in the new law and drawing attention to the statutory reports required. It should perhaps be added that the 1928 statute does not apply to Northern Ireland except in so far as it deals with importation. Matters connected with importation and the customs are not within the power of the Belfast Parliament, but with this exception the law of the sale of food and drugs is a matter with which that Parliament is competent to deal.

RADIOPHYLAXIS.

THE strength of growth of lentils germinated on wool at laboratory temperature can be gauged fairly accurately by the growth of the roots. Two investigators [1] in France have taken advantage of this fact in an attempt to discover whether a small dose of radiation has any effect upon the reaction to a large subsequent irradiation. Using 30 Rontgen as a preliminary dose, followed by 450 R. at a later date, and with all experiments controlled, they have come to the conclusion that the small initial dose definitely checks the action of the subsequent larger dose. In all they have made 48 experiments, from which they conclude that there is a definite phenomenon of "radiophylaxis" which seems to account for the apparent non-cumulative action of broken doses in certain experiments that have been detailed by other workers. The bearing of these facts on the application of radiations to the human subject is not necessarily obvious, for we do not know that the response of animal and vegetable cells to radiations is the same. If the parallel could be accepted, it would suggest that the greater efficiency of radiation treatment will be in the direction of massive doses rather than in the fractional dose method now so generally employed. Many of the older workers, however, are convinced of the greater efficacy of the oft-repeated small dose as against the massive dose, so that it seems reasonable not to draw conclusions from botanical experiments until these have been corroborated by similar or parallel experiments on animal tissues. It may be that the well-known latent period of 10 to 20 days in the action of radiations on the human subject has not time to develop in the more rapidly growing cells of the plant.

THE DANGER OF HIGH-TENSION CURRENT.

THE tragic death of a child while undergoing an X ray examination at a hospital recalls attention to the constant need of watchfulness when electric current of high potential is used for the purposes of medical diagnosis or treatment. The evidence given at the inquest is summarised in our medico-legal column. The coroner's jury returned a verdict of accidental death and imputed no culpability to anyone present in the X ray room when the accident occurred. It was accepted by the coroner as scarcely doubtful that the danger zone of the apparatus had been encroached upon by the unfortunate position of an attendant who must unwittingly have placed herself in what was an ideal position to form a complete electric circuit, which when completed was sufficient to electrocute the child. The danger is one which cannot at present be eliminated by mechanical contrivance alone. If the X ray tube is above the couch, as it may be for diagnosis, and must be for treatment, it is practically impossible to eliminate risk entirely, although the risk can be reduced by protecting the cables from accidental contact with anyone who is attending the patient. To surround the cables with cages right down to their connexion with the tube would impede the free movement of the tube which is essential for accurate diagnosis. When the X ray tube is above the couch the cables joining it to the coil or transformer rise from it to the overhead cables, and they cannot be placed out of reach or removed from the possibility of being touched by anyone who is not aware of the danger. A nurse, for instance, might be close to one of these cables, and the patient might raise an arm and bring it near the X ray tube when a spark would be likely to pass through the intervening air gap. The cables must be light and, therefore, cannot be perfectly insulated with any material at present known. The risk is of smaller degree when the tube is underneath the couch, for the cables can then be kept out of reach of careless hands. If the tube is worked from a coil death from electric shock is very unlikely to occur, but in a large proportion of the high-power apparatus now installed the tube is worked from a transformer, when the risk is much greater. In speaking thus of greater or smaller risk it should, of course, be borne in mind that the risk, though present, is very small indeed, and accidents of any kind are very infrequent. Mechanical perfection in the apparatus and the increased training and experience of radiologists and their technical staff has happily reduced the risk to a very small compass, but this fatal accident will have served a useful purpose if it has reminded all who have to do with such electrical installations that they are dealing with lethal weapons in which the human element is still present and that care and watchfulness must never be relaxed.

[1] Angel, P., and Lallemand, Suzanne: Compt. rend. de la Soc. de Biol., 1928, xcix., 1588.

CANCER MORTALITY IN IRELAND.

WITH the single exception of Switzerland, every country in Europe has recorded increasing rates of mortality from cancer during the last 40 years. In spite of these records there are some who doubt that any actual increase in prevalence has occurred. At a recent meeting of the Section of State Medicine of the Royal Academy of Medicine in Ireland, the President, Prof. Joseph W. Bigger, advanced the proposition that there has been no increase in cancer mortality in Ireland in the last 50 years—supporting his argument by means of tables projected on the screen. The first of these compared certain statistics of 1875 with those of 1925, and established the fact of a decrease in the general death-rate, the infantile mortality-rate and the infectious disease death-rate, associated with a rise in the percentage of total deaths which occurred over the age of 45 years. The second showed a higher proportion of persons aged over 45 years in the population in 1925 than in 1875. Death was ascribed to cancer at the rate of 33·2 per 100,000 living in 1875, and 94·2 in 1925, the increase being chiefly in the age group 45–65 years. Certain other diseases, including ulcer of the stomach and intestine, hepatitis, jaundice and diseases of the liver, ascites, atrophy, and debility, which were common causes of death in persons aged over 45 years in 1875, had greatly decreased or even disappeared in 1925. Prof. Bigger calculated how many deaths from these conditions would have occurred in Ireland in 1875 if the 1925 rates had prevailed, and deduced the excessive deaths from each of these causes in 1875. He argued that a proportion of these excessive deaths (in persons aged over 45 years) were really due to cancer, assessing the proportion at from one-eighth (in enteritis) to one-third (in ascites). These presumed cancer deaths he then added to the actual records of 1875. Turning to "senility" as a certificated cause of death, he pointed out that comparing the later year with the earlier, the deaths so attributed had been greatly reduced, while the number of old persons in the population had increased; 52 per cent. of deaths of persons aged 65 to 75 years were ascribed to senility in 1875, 20 per cent. in 1925. Calculating as before the excess of these deaths in 1875 above what would have been recorded at the 1925 rate, and assuming that certain fractions of this

excess were really due to other causes, Prof. Bigger obtained a further quantum of deaths (recorded as due to senility in 1875) which were probably due to cancer. After applying these corrections to the recorded cancer deaths, the true cancer death-rate for 1875 works out at 95·2, a figure nearly identical with that of 1925. Prof. W. D. O'Kelly, in opening the discussion, asked if cancer was merely increasing because so many people were going into the towns; he assumed that it was a disease of civilisation. Criticising Prof. Bigger's redistribution and the causes of death in 1875, he thought that a large proportion of those attributed to senility would now be regarded as due to heart disease, pneumonia, or bronchitis. Cirrhosis of the liver would absorb a large number of the deaths from ascites ascribed by Prof. Bigger to cancer. Sir John Moore remarked on the part played by surgery in enabling the diagnosis of cancer to be verified before the fatal onset, and on the prolongation of life due to the gradual subsidence of some of the more dangerous epidemic diseases, which permitted the population to live to an age when degeneration due to cancer manifested itself. Dr. W. M. Crofton thought that if the death-rate figures of some easily diagnosable condition such as cancer of the breast or tongue were compared there would be little or no difference between 1875 and 1925. Prof. Bigger, in summing up, said he did not believe that civilisation played any considerable part in the production of cancer; there was, he thought, no great difference in the prevalence of cancer in country and town. A friend of his in East Africa wrote that he had done 12 operations for cancer on natives, thus dispelling the theory that native races are immune. He agreed with Sir John Moore that one reason for the apparent increase in cancer was the prolongation of life owing to the diminution or almost complete disappearance of small-pox, typhus, typhoid, and other infectious diseases. It was difficult, he thought, to place reliance on registration records of deaths in the old days; the improvement in registration of recent times was due to increased medical knowledge among Irish practitioners and dispensary doctors.

HEALTH INSURANCE CHANGES.

THE New Year sees some important changes in the administration of the National Health Insurance scheme, the effect of which will be to simplify its working. Reference to these is made on p. 46. The first change concerns the regulations governing the calculation of arrears in payment of contributions while the insured person is out of work. Certain penalties to be enforced when arrears had lasted so-and-so many weeks are abolished by the new Act, this concession to genuine unemployment being rendered possible by an annual grant out of the Stamp Sales Account. Difficulty in determining whether the unemployment is genuine or not may require the production of certificates by officials of the labour exchanges. Another important change is an extension of what is known as the free year, which is lengthened to 21 months. At the end of this period the approved societies will have sufficient evidence before them to show whether an insured person is entitled to a further period of 12 months' insurance on account of unemployment. The effect of these new provisions will be greatly to diminish the number of notices issued and of complaints which arise from the reduction or suspension of benefits. A voluntary contributor who ceases to pay contributions will remain insured for a period of approximately 21 months as in the case of an employed contributor who ceases to be employed. There will, however, be no further extension, as in the case of an employed contributor, if a voluntary contributor becomes genuinely unemployed; but in this case also sickness will lead to extension of the free year. The provisions relating to deposit contributors are altered very considerably. The fund is divided into two parts, a deposit section and an insurance section. Any deposit contributor may on application be transferred to the insurance section on two conditions: (1) application must be made within a prescribed time and in a prescribed manner, and (2) the applicant must prove that the state of his health is such that he cannot obtain admission to an approved society. If his health improves he must try to obtain admission or failing this he may be reinstated in the deposit section. To provide funds for sickness benefit in the insurance section certain transfers will be made from moneys accruing from interest on the whole funds of the section or amounts standing to the credit of deposit contributors upon death or emigration. There are certain changes relating to the sickness benefit of married women; one such provides that a woman shall not be suspended on marriage where unemployment is due to inability to obtain work; another increases the amount of sickness benefit payable and alters the conditions to some extent.

Alterations in additional benefit chiefly affect the approved society administration and the determination of disposable surpluses. New additional benefits are these:—

(1) The provision of specialist treatment, not being treatment within the scope of medical benefit or any other additional benefit.

(2) Payment to approved charitable institutions in respect of treatment of members.

At the same time certain additional benefits are repealed—namely: (1) medical treatment and attendance for dependents of insured persons; (2) payment of disablement allowance to members not totally incapable of work; (3) payment of pensions or superannuation allowances; (4) payments of contributions to superannuation funds; and (5) remission of arrears.

It must be a continued source of chagrin to all who remain faithful to the health insurance principle that the Economy Act, under which the Treasury grants to insurance funds were reduced, postponed the much-needed laboratory and specialist services. It may be contended that many additional benefits will be available when the sickness claims are reduced, but at the moment we have to face the fact not of surpluses, but for the first time of deficits in many of the funds. The auditor's report for 1927 shows that the total receipts for England were £33,670,000, while the total expenditure on benefits was £30,069,000 and on administration £4,326,000. The English Fund was thus £725,000 to the bad, while the Scottish deficit for the same period was £273,000.

TRANSMISSION OF DISEASE BY TRANSFUSED BLOOD.

WITH the multiplication of blood transfusions in all countries it is inevitable that their dangers should be sometimes emphasised by the occurrence of accidents. The main sources of danger are two: incompatibility of the transfused blood, and diseases that may be transferred with the blood from donor to patient. The first danger is now fairly fully understood, thanks to the researches of Landsteiner and Levine at the Rockefeller Institute and of many others, and it is not often that accidents happen. The transmission of disease also occurs surprisingly seldom when it is realised how difficult it is entirely to guard against it. The two diseases chiefly to be remembered are syphilis and malaria, and it is the duty of everyone entrusted with the task of selecting blood donors rigidly to exclude any individual who could possibly be suspected of harbouring either of them. For the elimination of syphilis the Wassermann reaction must be used as a routine measure, except in an emergency when no tested donor is available. The spread of organisations of voluntary donors in London and the provinces is, of course, gradually eliminating the use of untested donors even when haste is essential. In the earlier days of transfusion several cases were recorded from America in which syphilis was actually transmitted, in one instance from a son to his father; but no case has been published in recent years. Malaria is more difficult to avoid, since there is no test and reliance has

to be placed on the donor's statement that he has never had the disease. The moral of this is pointed by an occurrence described by our Vienna correspondent (p. 44) where a donor, in spite of his statement that he had never had malaria, was proved to have infected four people by transfusions. Other common diseases which have been transmitted in the same way are some of the exanthemata. The transmission of measles in two cases from a mother to her infant was reported from Chicago in 1924,[1] the blood having been taken two days before the appearance of the rash. Small-pox has also been transmitted recently,[2] the blood again having been taken two days before the eruption appeared. The existence of an incubation period must always make the complete elimination of this accident impossible. Much queerer events than these have also been described. On one occasion a patient was temporarily endowed with horse-asthma after having received the blood of an individual subject to this condition.[3] Again, a recent report[4] from Scandinavia records the transfusion of blood from a donor who was seven weeks afterwards found to be suffering from acute myeloid leukæmia, from which he presently died. Fortunately for the patient, if unfortunately for medical science, no symptoms developed in the recipient, so that the question whether leukæmia can be transmitted in this way is still unanswered. It is evident, however, that these accidents are relatively so uncommon that no exaggerated fear need arise in the minds of either the public or the profession. Comfort may also be derived from the statement[5] made in 1925 that the blood of tertiary syphilitics may be safely used for transfusion. It was a somewhat bold experiment, ten non-syphilitic patients being transfused from six syphilitic donors in a late stage of the disease. None of the patients was infected, but the use of such donors is, of course, not to be recommended.

SUPRARENAL TUMOURS IN CHILDREN.

THE exact terminology applied to new growths of the suprarenal glands is often confusing, and in children such tumours are usually so misleading in their clinical manifestations as to render precise diagnoses very difficult. The subject is, however, not really so complicated as is often made out, and a recent report[6] of a case of malignant suprarenal tumour in an infant, with a brief survey of literature, very much simplifies the classification. Tumours of the suprarenal cortex either give rise to no symptoms at all, like the simple adenomas, or produce curious disturbances of sexual development. Tumours of the medulla of the suprarenal are in reality new growths of the sympathetic nervous system, and the term "neuroblastoma" is used for them, or more simply "medullary sarcoma of the suprarenal." These latter tumours are especially liable to cause difficulty, for they metastasise so early that, the secondary deposits seem to dominate the picture, while the primary growth may only be discovered at autopsy. Tumours of this variety fall into two groups. The "Pepper" type occurs in babies between six weeks and four months old, usually growing in the right suprarenal, and giving rise to an enormous enlargement of the liver which is diffusely infiltrated with secondary deposits. The "Hutchison" type is, as a rule, found in children between one and five years of age. The primary growth, usually in the left suprarenal, is bigger than it is in the Pepper type, while secondary deposits occur in the bones, especially those of the skull. It is in such cases that difficulty may arise because secondary deposits in the orbit, producing proptosis, may occur before the primary growth is discovered, and the diagnosis from chloroma can often only be made from a blood count. In the paper from which this review is taken van Veen describes a case of the Pepper type in an infant aged only 18 days. The main clinical feature was the huge size of the abdomen due to an enormous liver. Blood count showed a slight decrease in the red cells with an increase in the leucocytes. The van den Bergh reaction in the blood was negative and so also was the Wassermann reaction. The child died at the age of 6 weeks, and at the autopsy the liver was seen to be very large, pale, speckled, smooth, hard, and infiltrated throughout with metastases, while the primary growth was in the right suprarenal with a somewhat compressed right kidney. Dr. van Veen discusses the histological appearance of the tumour and its relationship to the sympathetic nervous tissue. His observations may be correlated with those of Dr. D. M. Greig,[1] who in a paper which has just appeared gives an account of the histological appearances of the Hutchison type, describing fully a case in which there were secondary deposits in the region of the right side of the face and skull. He is interested especially in the nature of cephalic metastases in these cases, and points out that the secondary deposit is in the soft tissues at first and infiltrates the bone later. After a period of bone absorption there is great activity of the bone cells with local excess of calcium salts leading to formation of new bone. This bone cell activity is the direct result of the excess of vascularity which the highly vascular tumour has ensured. In Greig's case the primary growth was in the right suprarenal, which is a slightly less common site than the left suprarenal for the primary focus. He quotes the work of Frew to show that the cephalic distribution roughly follows the side of the primary growth, owing, it is believed, to the anatomical arrangement of the lymphatic drainage of the suprarenal glands.

[1] Amer. Jour. Dis. Child., 1924, xxvii., 256.
[2] Ann. Clin. Med., 1926, iv., 722.
[3] Jour. Amer. Med. Assoc.,1919, lxxiii., 984.
[4] Act. Chir. Scand., 1928, lxiv., 369.
[5] Amer. Jour. Syph., 1925, ix., 470.
[6] Jahrb. f. Kinderheilk., December, 1928, p. 214

HOSPITAL AFTER-CARE AT SHEFFIELD.

ANONYMOUS generosity has made it possible to inaugurate a valuable scheme for after-care and convalescence at the Sheffield Royal Infirmary. There, as elsewhere, it has been felt for a long time by the infirmary board that the work of an institution of 500 beds was incomplete if it ceased automatically when the patients left the wards. It is desirable in the ex-patient's interest that his progress should be carefully watched, his diet supervised, arrangements made for further examination and treatment on the first sign of retrogression; and equally desirable in the interests of posterity that complete records of progress should be available as a guide and control to the treatment of others. We are to-day at a period in hospital development when we must appraise our results more intelligently in order more accurately to register what we are accomplishing. The patient must be followed actually to his home or place of work in order to estimate how his physical condition is standing the strain of normal life. Valuable information will be obtained from an after-care scheme with a well-organised follow-up and a collation of the data so obtained. In the case of the Sheffield Infirmary scheme the primary functions are several, and may be epitomised thus: to gain knowledge of the patient's condition after discharge from hospital; to coöperate with any and every agency with a view to rapid restoration to health; to help the patient to understand the treatment recommended, prescribed, and often supplied by the hospital; to furnish where necessary surgical appliances, artificial limbs, splints, trusses, and the like; to supply drugs like insulin and special diet for diabetics who cannot take the food of the ordinary household. The scheme is drawn up specially with a view to convalescence; in accordance with the wishes of the founders expressed in a trust deed the fullest use will be made of convalescent homes, particularly of homes offering special treatment. The word convalescence is to be construed in its broadest sense, and under this heading will be provided home nursing

[1] Edin. Med. Jour., January, 1929, p. 25.

where needed. The Sheffield Royal Infirmary has for a number of years past employed an almoner in the capacity of inquiry officer and assessor of means. This work will form part of the new after-care department, the registration of patients being one link in the chain which will keep the patient in touch with the hospital from the time of entering it until health is restored. The appointment of women specially trained for this work is under consideration, and it is hoped to open the new department shortly. Sheffield is to be congratulated on the generosity of the two benefactors who have made the scheme possible, and the Royal Infirmary on the foresight shown in the arrangements for making it a success.

RESEARCH INTO ASTHMA.

ON Jan. 15th the Lord Mayor of London will inaugurate a national appeal for funds, to enable the Asthma Research Council to develop a well-conceived scheme of investigation into the cause and treatment of asthma and allied disorders. Since we gave publicity last spring to the aims which prompted the establishment of the Council, its Medical Advisory Committee has been expanded to include men who work in widely separate parts of the country and whose angles of approach to the problem of asthma are even more distinct. Their names are set out in a letter (see page 50), wherein the immediate plans of the Council are summarised. Membership of the Medical Advisory Committee involves not only general counsel but active coöperation, since it is proposed to establish throughout the country research centres, financed by the Council, under the supervision of individual members of this Committee. The Royal Infirmaries of Liverpool, Edinburgh, and Manchester, the Stobhill Hospital, Glasgow, the General Hospital, Birmingham, and the Royal Victoria Hospital, Belfast, have already consented to supply facilities for research on these lines, and other provincial hospitals are considering the question. Laboratory investigations will be carried out at Edinburgh, Bristol, and at King's College Hospital, and St. Mary's Hospital. In London, clinics are being formed at Guy's Hospital under the direction of Dr. H. W. Barber, Dr. R. D. Gillespie, and Dr. Arthur F. Hurst, and at the Hospital for Sick Children in Great Ormond-street, where Dr. E. A. Cockayne will take charge. Both these clinics are financed by the Halley Stewart Trust endowment, which has made a grant of £2500 spread over four years for this purpose. At Guy's the clinic is especially designed to supplement and complete an investigation into the biochemical causation and treatment of asthma which is being undertaken by Dr. G. H. Oriel under the auspices of the Medical Research Council. It is proposed to carry out a controlled survey of the effects of different sorts of treatment on selected cases. The physicotherapy in use at various continental spas has excited the interest of the Council, and under a grant from the British Humane Association Dr. Una Ledingham has been appointed Research Fellow to study technique. She has visited Reichenhall, Mont Dore, Ems, Hamburg, Berlin, and Paris, and is now testing the methods favoured at these centres in this country, on suitable patients, by means of apparatus installed by the British Humane Association. Saline and pine oil inhalations, automatic breathing apparatus, expiratory exercises, nasal gas applications (CO_2), ultra-violet light, and diathermy are all being tried.

The businesslike way in which the Asthma Research Council is setting up a well-designed network of small centres throughout the British Isles deserves high praise. The well-established variations in manifestations and response to treatment of asthma may eventually be correlated with variations in geology, flora, or even clan. Since the climatic factor looms so large if not in the pathology certainly in the treatment of this strange disorder, there is every reason for decentralisation of activities. It is a wholly unexplained fact that while one asthmatic is well only in a warm dry climate, high above sea-level, his brother—sometimes literally his brother—is free from attacks only in low marshy areas. Light may be thrown on these discrepancies in members of families subject to asthma and the curious disorders of the skin and other systems sometimes associated with it, by the questionaire on family history which is being circulated by the Council. Forms have been prepared for the collection of statistics concerning the influence of heredity on the whole asthma syndrome. These forms are available in duplicate in order that control charts of non-asthmatic families may be prepared, and medical men are urged to coöperate in the research by distributing them among their patients. The help of the afflicted may properly be enlisted in order that the £50,000 required for the establishment of investigation centres and the development of research schemes will speedily be raised. The headquarters of the Asthma Research Council is at 42, Ranelagh-road, London, S.W. 1, and it is to this address that inquiries should be directed and donations sent.

Mr. John Humphrey Plummer, of Southport, has left about £250,000 to the University of Cambridge in order to endow two chairs for the promotion of modern scientific research.

THE annual congress of the Ophthalmological Society of the United Kingdom will be held in London from Thursday to Saturday, April 11th–13th. On the Thursday, at 2.30 P.M., Mr. E. Maddox, Group Captain Cecil Clements, and Mr. Charles Goulden will open a discussion on Heterophoria, and on the Friday, at 8 P.M., Sir Arnold Lawson, Dr. R. A. Young, and Mr. S. A. Browning will speak on the Diagnosis and Treatment of Ocular Tuberculosis.

THE City of Cardiff is about to lose the services of the medical superintendent of its mental hospital, Dr. Edwin Goodall, who has decided to retire from active work there in April. The hospital was Dr. Goodall's own creation, for he came to Cardiff from the Carmarthen Mental Hospital in 1906 to supervise the preparation, furnishing, equipment, and staffing of the new City Asylum, which was opened in 1908. Under his direction the institution has acquired all the equipment considered necessary for the up-to-date mental hospital. There is a full staff of visiting specialists, a radiological and ultra-violet installation, an operating theatre for general and special surgical work, and a hydrotherapeutic department. Nearest to Dr. Goodall's heart is the biochemical laboratory, built in 1910, at a time when biochemistry was associated with psychiatry in the minds of only a very few. It is equipped with sterilising and instrument room, bacteriological apparatus, and a department for physiological research, and over 50 original papers have been published by its staff, recent work including research into phosphorus, calcium, and cholesterol in the blood, and basal metabolism in mental disorders. Nor has Dr. Goodall neglected pioneer work in the treatment of early mental disorder, for he has been physician in charge of the psychiatric out-patient clinic at the Cardiff Royal Infirmary since its inception, and he has exerted himself in the field of legislative reform. During the war his institution became a hospital for wounded soldiers. The City Mental Hospital is happy in retaining Dr. Goodall's services as a consultant.

BRITISH CONGRESS OF OBSTETRICS AND GYNÆCOLOGY.—The seventh congress will be held in Dublin from April 24th to 26th, under the presidency of Dr. Gibbon FitzGibbon. The chief subject for discussion will be Disproportion, but there will be papers on many other subjects besides, and an exhibition of pathological specimens will be arranged. It is hoped to have a representative gathering from all parts of Great Britain and Ireland, and those wishing to take part should communicate as soon as possible with either of the joint honorary secretaries, Dr. Bethel Solomons and Mr. Gerald Tierney.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XVII.—THE INTERPRETATION OF BREAST HISTOLOGY.

WITH ILLUSTRATIVE PLATE

Facing p. 11; Legends to Figures on Plate on p. 11.

A CLINICIAN seeks the services of a pathologist in two circumstances: first, to report upon the condition of the breast and tissues after operation with the objects of confirming the diagnosis and of ascertaining the distribution of disease with a view to prognosis, or to the necessity or not of further treatment; and secondly, for the purposes of making a diagnosis when the clinical signs are not sufficiently definite to ordain the particular line of treatment. In this article features of outstanding importance are demonstrated which should enable a clinician to follow the descriptions of the pathologist. The clinician must not infer—under these circumstances—that the parts of a breast that were not removed are in the same state as those that were removed. It may happen that the early carcinoma of a cystic breast may exist in the parts left behind.

In order to obtain the best results the pathologist and clinician should work together in the closest coöperation. If possible they should examine the patient together before operation, and after it the pathologist should remove the portions of tissue he requires for his examination and report. If this desirable course is impracticable the clinician should give the pathologist as complete a clinical report of the breast and patient as he possibly can. Invaluable pathological reports are based upon whole microscopical sections of the entire parts removed. I have carried out the method of cutting whole sections for 25 years, and my knowledge is based chiefly on this method, but as yet it has not been generally adopted. Where the method of cutting whole sections is impracticable it is well to get as near to it as possible by means of smaller ones. When only that segment of the breast has been removed which contains the localised nodularity, or lump of doubtful nature, the wound should be immediately and thoroughly washed out with a 1-1000 watery solution of perchloride of mercury, to kill any epithelial cells that may have been squeezed out during the process of excision, and to prevent transplantation of carcinoma cells in the event of the lesion being malignant. This lotion should be used even if the parts were removed by diathermy.

In order to guide the clinician a pathological report upon a breast lesion should include the precise state of the epithelium and connective tissues. The report should be arranged on the following pattern by dividing it into two categories: (1) the state of the epithelium, and (2) the state of the connective tissue.

THE STATE OF THE EPITHELIUM.

The state of the epithelium will be discovered to be among the three classes: (*a*) genetic, (*b*) desquamative epithelial hyperplasia, and (*c*) dysgenetic epithelial hyperplasia. Hyperplasia of this type is a tumour immediately the process begins.

(*a*) *Genetic.*

This class includes all normal epithelial hyperplasia. The morphological appearances of all breasts at birth (male and female), at puberty, and in pregnancy and lactation bear very close resemblances to each other. In all these conditions new ducts and acini are being formed, and these epithelial new formations are always accompanied by hyperplasia of the pericanalicular and periacinous connective tissue. Lymphocytes are often seen among the fibres of the latter tissue. Whenever the breast appears normally active, the epithelium and the pericanalicular and periacinous connective tissue take part in that activity.

The development of breasts is incomplete at birth in both males and females; the morphological appearances are chaotic and variable at this age. Sometimes the epithelial columns that dip down from the skin and penetrate and branch amongst the subjacent connective tissues look very like carcinoma. At others places the hyperplasia of the pericanalicular and periacinous connective tissue appears like a highly extravagant condition of what is commonly called "chronic mastitis."

At puberty and lactation the same tissues are active, but in a much more orderly form than they are at birth. It will always be impossible to understand the condition now described as "chronic mastitis" until it is realised how closely the changes at puberty and lactation (Figs. 1 and 2) are imitated and reproduced in "chronic mastitis" (Fig. 3). A breast in this condition has a marked physiological relation to active normal breasts, and this relation will be made clear when this subject is being discussed (see below). A breast in chronic mastitis is merely one in a state of activity when it should be at rest. The development and formation of the common fibro-adenomata in breasts at puberty will also be more fully understood when its fabric is compared to those tissues which are undergoing physiological hyperplasia in the same breast at the same time.

FIG. 3.

Lobule of a breast suffering from mazoplasia. A, duct full of irregular-shaped, badly staining shed epithelial cells. The acini are also full of shed epithelium. At B there are some newly formed acini. C, pericanalicular and periacinous connective tissue which has undergone hyperplasia in which many lymphocytes can be seen. Strands of the supporting connective tissue of the breasts can be seen separating adjacent lobules from each other.

(*b*) *Desquamative Epithelial Hyperplasia.*

Epithelial hyperplasia is desquamative when the process ends in the shedding from the surface of the epithelium of cells which are incapable of separate existence and of multiplying, and which finally die. The process is normal in development, in puberty, in pregnancy, and during lactation. It is pathological in two types: (*a*) in *mazoplasia* ("chronic mastitis"), and (*b*) in *cystophorous hyperplasia*. I consider the separation of mazoplasia from cystophorous hyperplasia to be of great importance. They are different

processes; they can exist as independent conditions; neither of them has any connexion with "chronic inflammation." Mazoplasia is an unimportant state in its relation to all other tumours except—like puberty—to fibro-adenoma. It is a very common state, sometimes producing pain during life, and it can be frequently seen in breasts post mortem, where no complaint of pains had been made during life. It cannot be regarded as being in an important relation to carcinoma and papillomata. On the other hand, cystophorous hyperplasia is a cyst-forming condition related to tumour developments, and is a definitely pathological state.

Mazoplasia (chronic mastitis).—This condition has no possible ætiological connexion with an inflammatory process, and I therefore propose to give it the new name of mazoplasia.

In mazoplasia the acini and terminal ducts throughout the breast are filled with desquamated, small, irregular-shaped, badly staining epithelial cells. As in the normal active states of the breast there is also a hyperplasia of the pericanalicular and periacinous connective tissue, among the fibres of which lymphocytes may be common or absent. New acini may form in the lobules. The state resembles the breast at puberty also in another respect. The fibro-adenoma that is a typical tumour in a breast at puberty is very liable to occur in the state of mazoplasia, and new acini may form in the fibro-adenomata of both conditions. The fibro-adenomata of puberty and mazoplasia consist of an enormous and more or less local hyperplasia of the pericanalicular and periacinous connective tissue.

The anterior and posterior surfaces of the actual breast in mazoplasia are smooth on palpation. The nodularity of the cutaneous surface on which the diagnosis of "chronic mastitis" is so often made (and is commonly supposed to be so typical of the condition), is due to the fact that the terminal branches of the ligamenta suspensoria enclose fat lobules which, on palpation, give rise to the sensation of multi-nodularity of the surface of the gland. The multi-nodularity completely disappears if the branches of these ligaments are cut across by undercutting the skin, and it is not caused by a nodularity of the gland itself. A large amount of fat between the breast and the skin masks clinical signs in the breast and hides localised true nodularity and lumps of the gland where, in thin breasts, they would be palpable. The picture seen of mazoplasia in Fig. 3 need give no grounds for anxiety except for the possible formations of fibro-adenomata. It may last for years and is likely to cease after the menopause. Mazoplasia does not end in cyst formation, and cannot be regarded as a proemial state of—or as a prelude to—carcinoma. The generalisation of the pain in these breasts is the only important symptom of mazoplasia, and hence, for the purposes of diagnosis and prognosis, is not a symptom that suggests anything more dangerous. Focal pain at one part of one breast is a much more serious symptom, whether it appears alone or in a localised nodularity in either a thin or fat breast.

Transillumination of the breast, recently proposed as an aid to diagnosis in breast lesions by Max Cutler, of New York, is a valuable help. In normal breasts and in mazoplasia the Cameron light renders the gland translucent. Any localised shadow shown by transillumination indicate the presence of a tumour. Cysts, however, are translucent and cannot be differentiated from the rest of the breast by transillumination.

Cystophorous Hyperplasia.—In the cyst-forming type of desquamative epithelial hyperplasia the morphological appearances are distinct from those of any other lesion in the breast. The appearances are so peculiar that they have been mistaken by others for the sweat glands of the skin. I am sure they are true breast structures, and can always be connected up with normal breast ducts by making serial sections.

The cystic dilatations are caused by the desquamative epithelial hyperplasia which occurs in the acini and terminal ducts. At A in Fig. 4 the process can be seen occurring in a transverse section of a terminal duct in which large shed colostrum-like cells are arising in all stages of formation from the epithelial wall. The acini into which this duct leads are also in a state of desquamative epithelial hyperplasia (see Fig. 4, B and B_1). In some parts the cells are feathery and in others more stunted. In the acini the hyperplasia is often a little more than one of mere desquamation and in parts small papillomata have formed as well. At other parts, before the epithelial cells are finally shed they have piled themselves on the top of each other to form columns of epithelial cells only.

The morphological appearances are so typical that there should never be any doubt about the diagnosis. One terminal duct and its acini may be affected only (see Figs. 4, 5, and 6). The whole of only one duct and its branches and acini may be affected and occupy a whole segment of a breast or many terminal ducts, and acini may be affected and scattered with no particular arrangement about the whole of the gland. The state may be unilateral or bilateral. The confluency of affected acini form the common large cysts of the breast.

Dysgenetic epithelial hyperplasia can be detected occurring in cystophorous hyperplasia (see Figs. 5 and 6), a fact which at once converts the latter into one of more potential importance than mazoplasia by showing it is one that is a prelude to more dangerous types of epithelial hyperplasia. In small cysts the epithelial hyperplasia is more active than in the large ones.

There must be such stagnation of contents in the cysts as would allow a contained irritant to act undisturbed and for a long time; this may be the explanation of a harmless type of epithelial hyperplasia developing into one that is dangerous. Whether this be the explanation or not, there can be no doubt about the fact that tumours—papillomata and carcinoma—arise in the cysts as additional complications. I regard cystic breasts as proemial to these complications, and are very likely to contain one or more examples of tumour formation. For instance, I have discovered carcinoma in seven cystic breasts in which its presence was not even suspected, and in others a variety of tumour formation.

(c) *Dysgenetic Epithelial Hyperplasia.*

Epithelial hyperplasia is dysgenetic when it results in the pathological formation of living cells which are capable of multiplying. Dysgenetic epithelial hyperplasia forms a tumour from the moment of its inception and occurs in four separate conditions.

1. The epithelium may more or less retain its normal appearances, although it covers papillomata (see Figs. 6 and 7). Papillomatous formations in the ducts may even develop into a focus of breast glandular structure containing ducts and acini.

There can be no doubt that papillomata may exist for years without any further complication than an intermittent spontaneous discharge of blood from the nipples; in fact they may exist without any clinical signs at all, and be accidentally discovered in association with carcinoma elsewhere in the breast. In spite of the apparently insignificant course this purely papillomatous state may run, I consider it to be a dangerous state for the following reasons:—

There is no clinical sign upon which it can be decided whether there is a single papilloma or whether there are multiple papillomata. To discover a papilloma in one part of a breast does not exclude the probability of others in the unexamined parts of the same breast. When they are multiple they are just as dangerous as the condition of multiple papillomatous adenomata of the large colon which invariably ends in carcinoma. (Lockhart-Mummery and Cuthbert Dukes.) There is a distinct connexion between carcinoma and papillomatous formations. During the development of "tar cancer" in mice it is very common indeed for the area painted by tar to develop benign papillomata before carcinoma becomes established.

For all these reasons my outlook on the discovery of a papilloma is to regard it as a sign of potential—or of the existence of real—danger that demands the removal of the breast. In this connexion it must also be realised that an intermittent spontaneous

discharge of blood from the nipple may be induced by a benign papilloma or by a multiplicity of benign papillomata, by a duct carcinoma, and more rarely by a carcinoma developing from a dysgenetic epithelial hyperplasia in terminal ducts and acini (see Fig. 8).

2. The individual epithelial cells which result from the process may be arranged in a sessile manner unattached to any stalk of connective tissue (see Fig. 5). They may show signs of malignancy by exhibiting nuclear hyperchromatosis, variation in the size and shape of the cells, and mitosis, and I am convinced they are malignant, and yet the process may be still confined within normal boundaries of ducts and acini (Fig. 7).

3. In Fig. 8 the definite state of carcinoma is reached; some of the epithelial cells described in the preceding paragraph (2) have escaped into the surrounding tissues.

Some highly malignant tumours—of the thyroid gland, for example—may appear morphologically to be normal and give rise to normal secretions. Tumours of this class would still be dysgenetic in type because, however normal they look, they are pathological in growth and behaviour, and form metastases.

4. A pure adenoma may occasionally arise in the breast; it usually does so at the age of puberty and grows with great rapidity. Sometimes the patient is considerably older. It is a benign tumour.

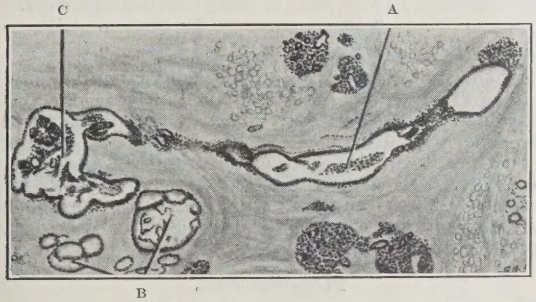
Pathological Changes in Connective Tissues.

A report on the condition of the epithelium would not be complete unless it contained a description of its relation to the connective tissues of the gland.

A. *The State of the Intra-Elastica Connective Tissue.*

This tissue exists immediately beneath the surface epithelium of ducts and acini, and consists of a single layer of unstriated muscle fibre on which the epithelial

Fig. 6.



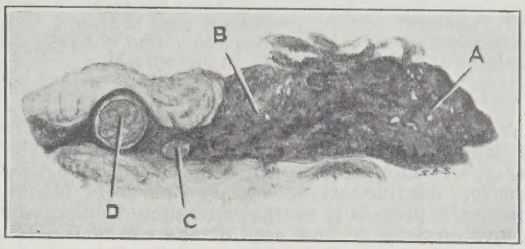
The figure has been drawn from a section of a terminal duct A and C leading into its acini B. The portion of the duct A and the acini B are in an active state of the cystophorous hyperplasia type 2. The portion of the terminal duct C is being distended by a dysgenetic epithelial hyperplasia which has undergone a papillomatous formation which is strictly limited within the normal boundaries of the duct. There was carcinoma elsewhere in this breast, for which it was removed.

cells lie, and loose connective tissue composed of scattered branching cells among a delicate fibrillous matrix. The intra-elastica tissue becomes most obvious when it undergoes hyperplasia, which it may do in terminal ducts and acini. It is usually quite localised in situation and never occupies large areas of the gland. Its condition and situation in a duct can be defined only when the elastica is especially stained. It is important pathologically because it gives origin to localised tumours which may grow and bulge into the ducts, forming small papillomatous growths; or it may be the site of origin of large fibro-adenomata (intracanalicular). When it exists in the presence of carcinoma it is the first tissue to be invaded by epithelial cells, before they reach the elastica. Hyperplasia of this connective tissue is often present in more or less degree when there are other pathological activities in the same breast, for which search should be made, and in this respect it resembles hyperplasia elastica.

B. *The State of the Elastica.*

Normally the elastica consists of a narrow, well-defined layer of elastic fibres outside the intra-elastica connective tissue of ducts. It is directly continuous with the subepithelial elastica of the nipple, areola,

Fig. 9.



A whole section (natural size) of a segment of a breast. The segment was removed because the fibro-adenoma D was discovered clinically. Microscopical examination revealed two important and common events. There is another fibro-adenoma C, and at B the breast has undergone a diffuse hyperplasia of the pericanalicular and periacinous connective tissue. The fibro-adenomata D and C were also composed of a much more localised hyperplasia of the same connective tissue. The age of the girl was 15½ years. The rest of the breast (A) shows marked regular hyperplasia of the pericanalicular and periacinous tissue amongst which lymphocytes are present. There is also a regular and extensive genetic new formation of acini.

and skin. It may occasionally surround some acini by a single narrow defined line, and it may here and there surround a lobule. It becomes pathological when it undergoes hyperplasia, which it may do to an enormous degree and be represented by more than 100 per cent. of its normal amount (see Fig. 8). In a state of hyperplasia it commonly surrounds acini as well as ducts, so that it must be assumed that the connective tissue forming part of the wall of the acini possesses the potentiality of forming elastica.

Hyperplasia elastica may affect the ducts and acini of the whole gland or it may be quite localised to a few ducts only. Hyperplasia elastica may occasionally exist alone, but usually it accompanies other forms of pathological hyperplastic activity, which should always be searched for when hyperplasia elastica is present. For instance, the elastica can be demonstrated to have undergone enormous hyperplasia round some terminal ducts and acini which contain the malignant epithelial hyperplasias from which the invading epithelial cells have escaped to establish the presence of carcinoma (see Fig. 8). Often the elastica may be absent—it is so at birth—and even later in life none can be detected in some glands even when the elastica of their blood-vessels stains normally.

Too often isolated deposits of carcinoma are described as being multiple foci of multicentric origin. If a deposit shows only the carcinoma cells in tissues where epithelial cells ought not to be, then that focus must be definitely described as a secondary deposit only. If, on the other hand, a terminal duct and its acini (Fig. 8) can be demonstrated full of epithelial cells identical in appearance with those invading outside structures, then it can definitely be described as a primary focus of carcinoma. In order to be quite sure that the tube is a duct and not a distended lymphatic vessel the elastica of the duct must be stained.

C. *The State of the Pericanalicular and Periacinous Connective Tissue.*

When discussing genetic epithelial hyperplasia I definitely stated that this particular connective tissue undergoes hyperplasia in states of normal activity and nearly disappears when the gland is at rest. It is an intimate component part of the true breast structures and it should be so regarded. The pericanalicular and periacinous connective tissue

usually becomes pathological by undergoing an excessive localised or diffused hyperplasia when it is normally active in the rest of the breast.

For example, the fibro-adenomata of puberty is composed of an excess of the pericanalicular and periacinous connective tissue which is being normally active elsewhere (Fig. 9). In fact a fibro-adenoma or fibro-adenomata (they are often multiple, see Fig. 9) of puberty may be regarded as being a more or less localised excess of the physiological activity that is present in the rest of the gland. This physiological likeness is increased when a fibro-adenoma of puberty contains newly formed acini which are also appearing in the rest of the breast at the same time. Again, appearances which are normal at birth, puberty, and in pregnancy and lactation become pathological when they are present at a time when the breast should be at rest—for example, in mazoplasia.

CONCLUSIONS.

A pathological report upon the state of epithelial hyperplasia should allude specifically to these epithelial states, and should state whether the hyperplasia be genetic, desquamative, or dysgenetic. If it be *genetic* the process is normal and should not give rise to any anxiety on the part of the clinician. If the epithelial hyperplasia be desquamative it is important to state whether it belongs to type (a) *mazoplasia*, or type (b), *cystophorous hyperplasia*. If it belongs to type (a), *mazoplasia*, there need be no anxiety about the future, except as regards the possible formation of fibro-adenomata. It is improbable that the condition would be complicated by the formations of papillomata or carcinoma. On the other hand, if it belongs to type (b), the *cyst-forming* type, the clinician will at once have the following grounds for anxiety: 1. There is almost the certainty of constant trouble arising from the appearances of fresh cysts. 2. A cyst may contain an epithelial hyperplasia which is no longer desquamative, but has become dysgenetic in type; therefore, however small the lesion may be, it is an epithelial tumour (see Figs. 5, 6, 7). The tumour may be papillomatous in type, sessile in type, or sessile and malignant in type, yet all these types may be contained within normal boundaries. No notion can be made as to how long they may thus continue. The papillomatous states are known to last a long time. For all I know the sessile benign-looking state and the sessile malignant-looking state may sometimes disappear entirely. On the other hand, if either of them progress, carcinoma is the inevitable result. Finally, if the epithelial hyperplasia is *dysgenetic* in type, the pathologist should state whether it is papillomatous and confined within normal boundaries, or whether it has transgressed them to become a duct carcinoma. Is it sessile and benign-looking and confined within normal boundaries? Or is it malignant-looking, but still confined within normal boundaries? Or is it a carcinoma? When pain is generalised over both breasts and no lump or local nodularity can be discovered, the gland belongs to the mazoplasia group and calls for no further treatment than support, attention to the psychic condition of the patient, correction of pelvic ailments, and the application of X rays or radium; the gland may be excised if the pain becomes unbearable. As to dysgenetic epithelial hyperplasia of the breast, its future treatment—so far as present knowledge is concerned—seems to depend upon how far the efficiency of radium can be trusted. It is possible that all forms of this type may be annihilated by the efficient application of radium. Until that time arises it is by far the safest course to remove by radical operation all breasts that are cystic and all breasts that contain dysgenetic epithelial hyperplasia. In the case from which Fig. 5 was drawn sufficient would have been done if all the ramifications and acini of the whole of the involved duct had been excised—a perfectly impossible operation. The same treatment would not have been indicated in the case from which Fig. 7 was drawn; unsuspected carcinoma was discovered upon microscopic examination of whole sections of the gland.

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Special Articles.

MILK CONSUMPTION AND THE GROWTH OF SCHOOL-CHILDREN.

SECOND PRELIMINARY REPORT ON TESTS TO THE SCOTTISH BOARD OF HEALTH.

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THE preliminary report by Dr. J. B. Orr on the result of the 1926–27 investigation into the feeding of a large number of school-children has already been published in THE LANCET (1928, i., 202). The conclusions which might be drawn from that work appeared to the committee in charge of the test to be so interesting and important that it was decided to continue the investigation over a further period of equal length.* That has been done and the present report deals with this period of the repeated test—namely, November, 1927, to June, 1928.

The seven centres at which the investigation was carried out were Peterhead, Aberdeen, Dundee, Edinburgh, Glasgow, Greenock, and Belfast. The number of children involved was 1425. At each place four groups of children were selected and each group treated differently. One group received whole milk, another separated milk, a third a biscuit ration of the caloric value of the separated milk, while a fourth acted as controls, receiving nothing.

The children of	13–14	years received	1	pint of milk daily.
,,	9–10	,,	1	,,
,,	6–7	,,	¾	,,

All the milk was given at the schools under supervision. The whole milk was pasteurised, except at Peterhead and Aberdeen, where it was "Certified." The separated milk was machine-skimmed. Samples of all the milk given were taken monthly and sent to the Rowett Research Institute, where they were analysed. These analyses show that the average fat percentage of the whole milk was 3·85 and that of the separated milk 0·33.

Measurements.

The measurements were all done by one of us (M. L. C.) and were done four times everywhere except at Belfast, where they were done three times. As in the 1927 test the children were all weighed and measured in indoor garments and without shoes. This year the heights were recorded to the nearest eighth of an inch and the weights to the nearest quarter of a pound. To obtain a fairly accurate *average* increase in weight a careful record was made at each weighing of every article of clothing worn by the child, and from these records the average weight of clothing for boy or girl was calculated. The difference between the initial (winter) and final (summer) weight of clothing was then added to the final gross weight. In Belfast in three schools the children were weighed in one garment only, and the difference between winter and summer weights was therefore the exact increase made by the child.

To obviate fluctuations, as far as possible, the weights and heights were taken at the same hour of the day

* Owing to the death of Dr. Lewis Cruickshank and to the absence of Dr. J. B. Orr abroad, it was decided to place the organisation of the second investigation in the hands of Dr. Gerald Leighton. This also enabled the Board's wide knowledge of the nutrition of school-children and the implications of such in connexion with public health to be more readily utilised.

on each occasion, this being in the case of children receiving milk before the milk was drunk. As far as possible the schools were visited in the same rotation in order that the period between initial and final weights and heights might be identical. On each visit an accurate record was obtained for each child of all absences and illnesses. Thus the exact amount of supplementary feeding was known. Any child who had missed 25 per cent. of feeds, or showed other abnormality, was excluded when calculating the results. The number so excluded was 268.

Special Conditions of the Investigation.

In considering the results of this investigation the following points should be borne in mind. The number of children involved was very large, no less than 1157 being available for the measurements from which the tables are compiled. These children were divided among seven centres of population in which the test was conducted simultaneously. Their ages ranged from 5 years to 13 years, including the beginning, the middle, and the end of their ordinary school life. All the children in the six Scottish centres were living in the ordinary conditions of Scottish working-class homes, and received the ordinary diet of such homes. The milk and biscuit given to them at the schools were therefore in the nature of a *supplementary ration to their home food.* The results therefore must be regarded as the effect of the addition of definite quantities of milk to the average home diet of children of school age living in ordinary working-class conditions in industrial centres. It would appear to be justifiable to infer that the same results, whatever they may be, would apply to the whole school population living their ordinary life. Those conditions, from the standpoint of a nutritional investigation, are, of course, very complicated, but this test was so devised as to bring out any *significant* differences which might arise within the limits laid down.

The following three tables show the total results of the investigation.

TABLE I.—*1928 Increases. Milk* versus *Non-Milk Groups and Percentages.*

—	No.	Height increase.	Weight increase.
13-year groups—			
Milk	137	1·4699 in.	5·6387 lb.
Non-milk ..	133	1·1908 in.	4·2368 lb.
		= +0·2791 in. —i.e., 23·44 %.	= +1·4019 lb. —i.e., 33·09 %
9-year groups—			
Milk	188	1·3943 in.	3·4202 lb.
Non-milk ..	212	1·1068 in.	2·0495 lb.
		= +0·2875 in. —i.e., 25·98 %.	= +1·3707 lb. —i.e., 66·88 %.
6-year groups—			
Milk	242	1·5021 in.	2·5331 lb.
Non-milk ..	245	1·2398 in.	1·8531 lb.
		= +0·2623 in. —i.e., 21·16 %.	= +0·6800 lb. —i.e., 36·70 %.
All age-groups—			
Milk	567	1·4585 in.	3·5776 lb.
Non-milk ..	590	1·1810 in.	2·4610 lb.
		= +0·2775 in. —i.e., 23·50 %.	= +1·1166 lb. —i.e., 45·37 %.
1927 Increases (Scotland—all ages)—			
Milk	551	1·470 in.	3·617 lb.
Non-milk ..	731	1·212 in.	2·974 lb.
		= +0·258 in. —i.e., 21·29 %.	= +0·643 lb. —i.e., 21·62 %.

From Table I. it is seen that taking all the ages combined of the 1157 children and dividing them into milk-fed groups and non-milk-fed groups, there is an average increase in height of 23·5 per cent. and in weight of 45·37 per cent. in favour of the milk-fed groups over the non-milk-fed groups. It is also seen that these increases are greater in this second and repeated test than they were in the first (1927) test.

Table II. shows the increase in height and weight in all the age-groups with the number of children in each group. In every case the milk-fed children are

TABLE II.—*1928 Increases in Age-Groups.*

—	No. of children.	Height increase.	Weight increase.
		in.	lb.
13-year groups—			
Whole milk	68	1·4540	5·5662
Separated milk ..	69 (270)	1·4855	5·7101
Biscuits	67	1·1194	4·4179
Controls	66	1·2633	4·0530
9-year groups—			
Whole milk	105	1·4238	3·5333
Separated milk ..	83 (400)	1·3569	3·2771
Biscuits	101	1·1077	2·0396
Controls	111	1·1059	2·0586
6-year groups—			
Whole milk	121	1·5589	2·7107
Separated milk ..	121 (487)	1·4452	2·3554
Biscuits	115	1·2424	2·1609
Controls	130	1·2375	1·5808
Total number.. ..	1157	—	—

ahead of the "biscuit" and "control" groups. The greatest increase in height is in the 6 year old milk-fed group. The greatest increase in weight is in the 13 year old separated milk group. The difference between the "biscuit" group and the "controls" is but slight except that the 13 year old "controls" did better in height but not so well in weight. In the 6 year old group the "biscuit" group is better in weight than the "controls."

In Table III. there is set forth the mean increase in pounds and inches (i.e., for weight and height) in each group at each age, together with the probable error involved and the significance or otherwise of the differences.

Other Observations.

In addition to the foregoing statistical observations two other lines were adopted which do not permit of being stated in figures.

Dr. C. A. Douglas examined all the children clinically when they were measured. Her report states that—

"In practically every case it was noted that the children receiving milk showed, even where there was obviously poor maternal care, that sleekness peculiar to a well-nourished animal. Their hair had a glossy and bright appearance. Their nails were smooth, resilient, and looked as if polished. General alertness was common to all the children fed on milk. No difference could be detected with regard to these points between the children receiving milk irrespective of the kind of milk. It was gathered from teachers and janitors that the children receiving milk were much more alert and very much more boisterous and difficult to control than the others. This latter fact was only too evident when they were waiting in small groups to be weighed."

Dr. G. W. Simpson made a different observation. He asked the headmasters to parade the children in their respective groups, he himself being unaware which group was milk-fed or otherwise. From this general survey he placed the groups in order of apparent standard of nutrition. Of five examinations thus made he found that first places of nutritional standard were accorded to three whole-milk and two separated milk groups. Second places were accorded to two whole-milk and three separated milk groups. Third places were accorded to all five biscuit groups, and fourth places to all five control groups.

"The difference in nutrition between groups receiving milk and not receiving milk was plainly evident. No great difference was noticed between the whole milk and separated milk groups."

TABLE III.—1928 NUTRITION TEST.

Those familiar with the manner in which statistics of this kind are worked out will be aware that, in order that the difference between two groups and figures may be regarded as "significant," that difference must be at least three times as great as the "probable error." The results in this table are calculated on that basis.

A. *13 years. Weights (Increases in lbs.).*

—	Increase. I.	Increase. II.	Difference.	Probable error.	Result.
Whole milk (68) v. Separated milk (69) ..	5·5662	5·7101	—0·1439	0·2979	— 0·483 Insignificant.
Whole milk (68) v. Biscuits (67) ..	5·5662	4·4179	+1·1483	0·3080	+ 3·728 Significant; better.
Whole milk (68) v. Controls (66) ..	5·5662	4·0530	+1·5132	0·2816	+ 5·374 ,, ,,
Separated milk (69) v. Biscuits (67) ..	5·7101	4·4179	+1·2922	0·3400	+ 3·801 ,, ,,
Separated milk (69) v. Controls (66) ..	5·7101	4·0530	+1·6571	0·3163	+ 5·239 ,, ,,
Biscuits (67) v. Controls (66) ..	4·4179	4·0530	+0·3649	0·3258	+ 1·120 Insignificant.

B. *Heights (Increases in Inches).*

Whole milk (68) v. Separated milk (69) ..	1·4540	1·4855	—0·0315	0·0424	— 0·743 Insignificant.
Whole milk (68) v. Biscuits (67) ..	1·4540	1·1194	+0·3346	0·0431	+ 7·763 Significant; better.
Whole milk (68) v. Controls (66) ..	1·4540	1·2633	+0·1907	0·444	+ 4·295 ,, ,,
Separated milk (69) v. Biscuits (67) ..	1·4855	1·1194	+0·3661	0·453	+ 8·081 ,, ,,
Separated milk (69) v. Controls (66) ..	1·4855	1·2633	+0·2222	0·0466	+ 4·768 ,, ,,
Biscuits (67) v. Controls (66) ..	1·1194	1·2633	—0·1439	0·472	— 3·049 Significant; worse.

C. *9 Years. Weights (Increases in lbs.).*

Whole milk (105) v. Separated milk (83) ..	3·5333	3·2771	+0·2562	0·1468	+ 1·745 Insignificant.
Whole milk (105) v. Biscuits (101) ..	3·5333	2·0396	+1·4937	0·1344	+11·114 Significant; better.
Whole milk (105) v. Controls (111) ..	3·5333	2·0586	+1·4747	0·1360	+10·843 ,, ,,
Separated milk (83) v. Biscuits (101) ..	3·2771	2·0396	+1·2375	0·1403	+ 8·820 ,, ,,
Separated milk (83) v. Controls (111) ..	3·2771	2·0586	+1·2185	0·1419	+ 8·587 ,, ,,
Biscuits (101) v. Controls (111) ..	2·0396	2·0586	—0·0190	0·1290	— 0·147 Insignificant.

D. *Heights (Increases in Inches)*

Whole milk (105) v. Separated milk (83) ..	1·4238	1·3569	+0·0669	0·0261	+ 2·563 Not quite significant.
Whole milk (105) v. Biscuits (101) ..	1·4238	1·1077	+0·3161	0·0281	+11·249 Significant; better.
Whole milk (105) v. Controls (111) ..	1·4238	1·1059	+0·3179	0·0263	+12·087 ,, ,,
Separated milk (83) v. Biscuits (101) ..	1·3569	1·1077	+0·2492	0·0237	+10·515 ,, ,,
Separated milk (83) v. Controls (111) ..	1·3569	1·1059	+0·2510	0·0215	+11·674 ,, ,,
Biscuits (101) v. Controls (111) ..	1·1077	1·1059	+0·0018	0·0239	+ 0·075 Insignificant.

E. *6 years. Weights (Increases in lbs.).*

Whole milk (121) v. Separated milk (121) ..	2·7107	2·3554	+0·3553	0·1112	+ 3·195 Significant; better.
Whole milk (121) v. Biscuits (115) ..	2·7107	2·1609	+0·5498	0·1020	+ 5·390 ,, ,,
Whole milk (121) v. Controls (130) ..	2·7107	1·5808	+1·1299	0·1031	+10·959 ,, ,,
Separated milk (121) v. Biscuits (115) ..	2·3554	2·1609	+0·1945	0·1055	+ 1·844 Insignificant.
Separated milk (121) v. Controls (130) ..	2·3554	1·5808	+0·7746	0·1066	+ 7·266 Significant; better.
Biscuits (115) v. Controls (130 ..	2·1609	1·5808	+0·5801	0·0969	+ 5·987 ,, ,,

F. *Heights (Increases in Inches).*

Whole milk (121) v. Separated milk (121) ..	1·5589	1·4452	+0·1137	0·0250	+ 4·548 Significant; better.
Whole milk (121) v. Biscuits (115) ..	1·5589	1·2424	+0·3165	0·0243	+13·025 ,, ,,
Whole milk (121) v. Controls (130) ..	1·5589	1·2375	+0·3214	0·0250	+12·856 ,, ,,
Separated milk (121) v. Biscuits (115) ..	1·4452	1·2424	+0·2028	0·0221	+ 9·176 ,, ,,
Separated milk (121) v. Controls (130) ..	1·4452	1·2375	+0·2077	0·0228	+ 9·110 ,, ,,
Biscuits (115) v. Controls (130) ..	1·2424	1·2375	+0·0049	0·0221	+ 0·222 Insignificant.

A sixth examination did not correspond with the other five, but in this case the best nourished children had been selected as "controls," while those apparently needing the milk most were put into the milk groups. The desired conditions for observation were thus not fulfilled.

TABLE IV.—*Groups Reversed.*

—	Average increase in— Height (inches). 1927	Height (inches). 1928	Weight (lbs.). 1927	Weight (lbs.). 1928
GLASGOW.				
5 year old children.				
Separated milk 1927, biscuits 1928	1·500	1·351	2·407	2·212
Biscuits 1927, separated milk 1928	1·101	1·454	2·234	2·237
8 year old children.				
Separated milk 1927, biscuits 1928	1·297	1·213	3·471	2·063
Biscuits 1927, separated milk 1928	1·089	1·336	2·266	3·207
GREENOCK.				
5 year old children.				
Whole milk 1927, controls 1928	1·543	1·163	1·994	1·875
Controls 1927, whole milk 1928	1·470	1·479	1·595	2·639

A Test Reversed.

One very interesting result came out in this repeated investigation. In order to ascertain what

TABLE IVA.—*Groups Continued.*

—	Average increase in— Height (inches). 1927	Height (inches). 1928	Weight (lbs.). 1927	Weight (lbs.). 1928
PETERHEAD.				
5 year old children.				
Whole milk	1·550	1·384	2·741	2·569
Separated milk	1·568	1·356	2·983	2·576
Biscuits	1·392	1·270	1·973	2·188
Controls	1·425	1·311	1·773	2·048
DUNDEE.				
8 year old children.				
Whole milk	1·105	1·197	2·556	3·205
Separated milk	1·209	1·347	2·659	3·000
Biscuits	0·931	1·054	2·404	2·738
Controls	0·972	1·156	2·433	1·911
EDINBURGH.				
8 year old children.				
Whole milk	1·483	1·429	3·330	4·057
Separated milk	1·457	1·383	3·238	3·531
Biscuits	1·286	1·031	2·972	1·650
Controls	1·224	1·100	2·132	2·438
GREENOCK.				
5 year old children.				
Separated milk	1·625	1·443	1·969	2·243
Biscuits	1·455	1·131	1·200	2·050

would occur two of the previous feeding groups were reversed. A group which in the first investigation received separated milk now received biscuit. Another group which in the first investigation were "controls" now received whole milk. The general result in both cases was that they changed places, the former milk group now receiving biscuit fell to the biscuit standard, while the former "control" group now receiving milk rose to the milk standard. Table IV. shows the detailed results of this reversed test. Table IVA. shows similar details for the other areas (groups continued not reversed).

Conclusions.

As the result of this repeated investigation (1927–28) it may be said at once that the tentative conclusions drawn by Dr. J. B. Orr from the first investigation were more than justified. The great value of an additional milk ration to that already taken at home is clearly demonstrated for all ages of school-children.

In the repeated test the average increase in height in the milk-fed groups in all ages combined is actually *1·21 per cent. more than in the first test.* The average increase in weight in the milk-fed groups in all ages combined is no less than *3·75 per cent. more than in the first test.* Not only have the same milk-fed children benefited again, but they have done so to a greater extent than before. Their initial improvement has *continued over the second year.*

Once more the value of separated milk for children of school age is shown. In most groups the difference in height and weight between the whole milk and separated milk groups is not "significant," but in the 6 year old group whole milk is "significantly" better than separated for both weight and height. In every case the whole milk and separated milk groups are better than the "biscuit" or the "controls." In this repeated test the difference between the "biscuit" and the "controls" is usually "insignificant"; the effect of the extra biscuit appears almost negligible. The improvement of the milk-fed groups in general health and appearance is clearly brought out in the reports of Dr. C. A. Douglas and Dr. G. W. Simpson. Many of the teachers have recorded similar opinions.

When these results are considered, along with those published by Dr. Corry Mann in this country and those of observers in other countries, the only conclusion possible is that they have a wide public health significance, especially with the nutrition of school-children.

"In 1903, when the Royal Commission on Physical Training (Scotland) issued their report, two things became clear: first, that medical examination and superintendence were essential conditions of any system of physical education; second, that in the end *the fundamental problem is one of nutrition.* . . . When every preventable ailment is prevented, and every serious disease treated to its finish, the new battalions of children coming forward have to be superintended from the nutritional standpoint."—Sir Leslie Mackenzie.

The two reports of this investigation fully substantiate these views.

Committee of Investigation.

The investigation was conducted under the direction of a Committee appointed by the Scottish Board of Health with Sir Leslie Mackenzie as chairman. The members consisted of the school medical officers for the cities and towns where the work was carried out.

We desire to thank Dr. J. F. Tocher, Aberdeen, and Mr. J. S. Thomson, Rowett Research Institute, for advice and help on the statistical side of this investigation. The results of the investigation have also been submitted from time to time to Prof. A. P. Cathcart, chairman, Nutrition Committee of the Medical Research Council.

The cost of the investigation was defrayed by a grant made by the Empire Marketing Board to the Rowett Research Institute, Aberdeen.

MEDICINE AND THE LAW.

Failure to Provide Medical Treatment for Child.—Rebutting Medical Evidence Called by Defendant.

THE parent who has been prosecuted before the Wolverhampton magistrates for neglecting his child in a manner likely to cause unnecessary suffering, in that he refused to sanction an operation for the removal of the child's tonsils,[1] made his final appearance before the bench on Dec. 16th. The Distributist League, of which Mr. G. K. Chesterton is president, had undertaken his further defence. Counsel, instructed by Birmingham solicitors acting for the League, said he desired to make it clear that, if an operation was considered to be the only possible remedy, nobody suggested that the operation should not be performed. The child had now been examined by four London consultants, two of whom were tendered as witnesses, while statutory declarations had been obtained from the other two. Dr. Fergie Wood stated that the little girl's tonsils were very much enlarged, but that he could not find any evidence of her health having suffered. He did not recommend an operation, but suggested a treatment. Dr. Bertrand Allinson said he found the tonsils enlarged and a slight deafness in the left ear. He, too, recommended treatment—a strict diet and breathing exercises; he said he would resort to surgical operation only as the very last remedy. Counsel for the defendant submitted that the parent, so long as he followed the advice of responsible doctors, could not be said to be failing to provide adequate medical aid for his child. The father, in the witness-box, expressed his willingness to allow the child to be examined monthly by a school doctor, and it was agreed that copies of the doctors' reports should be given him.

It may be recalled that the Wolverhampton bench, at the original hearing of this charge, was satisfied that the prosecution had made out its case, but that sentence was postponed for a month with the idea of seeing what action the defendant would take in the interval. The Deputy Town Clerk, appearing for the Wolverhampton Education Committee, explained that the Committee had not insisted on an operation, and that, if there were any other treatment which would effect a cure, such treatment would be regarded as adequate. The magistrates fined the father 40*s.* and dismissed the charge against the mother. They took the view that the father had failed to procure adequate medical aid for the child, although he had now agreed to adopt treatment to prevent the suffering caused to the child in the past. As was suggested in these notes recently, the evidence (above described) which was tendered to show that an operation was unnecessary might appropriately have been offered by way of defence to the charge, rather than as an afterthought in mitigation of sentence. The benevolent intervention of the Distributist League, whose mysterious title presumably conceals a policy of advocating individual liberty against State interference, has provided the material for defendants in future proceedings under Section 12 of the Children Act in enlarged tonsils and adenoids cases. It has to be borne in mind that, while the prosecution is presumably obliged to specify the medical or surgical treatment which the accused person is alleged to have neglected to provide, the magistrates have no power to order an operation; all they can do is to put pressure upon a defendant by suspending sentence with the hint that no punishment will be imposed if the medical advice is followed.

X Ray Apparatus Accident.

An unfortunate accident at the Royal Infirmary at Hull was investigated by the Hull coroner on Dec. 18th. A girl, 8 years of age, had fallen on the ice and broken her arm, and was taken to the Infirmary for X ray examination. During the third examination a

[1] THE LANCET, Nov. 24th, 1928, p. 1081.

nurse moved to another part of the room, and by so doing completed an electric circuit, with the effect that the child was killed, the child's mother (who was holding the child's hand) received a severe shock and the nurse also was injured. Dr. C. R. Moore, who was in charge of the X ray apparatus, said he gave the usual warning to those in the room not to touch the wires. Dr. J. E. Bannen, hon. radiologist to the Infirmary, explained at the inquest that, by going to the dangerous side of the table while the high-tension circuit was in operation, the nurse unwittingly placed herself in an ideal position—even if she did not actually touch the wires, but merely went near them—to form a complete electric circuit sufficient even at a low voltage to kill the child. There was no efficient method, he added, for insulating the leads. The jury returned a verdict of "accidental death." The coroner stated that there was no question of any culpability on the nurse's part; she had given her evidence with commendable candour. The admission to the X ray room of inexperienced persons was, he remarked, a question to be considered by the infirmary authorities.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Transmission of Malaria by a Transfusion of Blood.

AN unusual occurrence was disclosed recently during a discussion at a medical society in this city. The facts were as follows. A middle-aged woman, brought to a gynæcological clinic in Vienna, had to be operated on at once on account of an extra-uterine pregnancy. Both before and during the operation she lost a great deal of blood, so it was decided to perform a transfusion. From the list of donors who are at the disposal of the clinic, one was selected who was known to have acted in the same capacity three times before, and his blood was used in the ordinary way. The woman's condition picked up rapidly, but some time afterwards she developed high fever, and was transferred to a medical clinic, where the diagnosis of tertian malaria was made and confirmed. As she had never before suffered from malaria, the donor was at once suspected and was submitted to an examination, which showed the presence of plasmodia in his blood. He contended that he had never suffered from malaria—indeed, that he had never had any fever at all, and had not been outside Vienna. It was possible to trace the three other patients to whom he had acted as donor, and these also proved to have been infected. They had suffered from time to time from attacks of fever, but the right diagnosis was not made until they were summoned to the clinic for investigation. This incident shows the need for an exhaustive examination of donors, not taking too much account of a negative previous history.

The Health of Vienna.

The Federal Board of Health of Austria has published a report on certain factors which influence public health and the fluctuations of the population. During 1927 the population of Vienna was estimated at 1,866,147, and the deaths at 26,379. The number of marriages was 16,256, and the decrease of population (excess of deaths over births) was 5042—that is to say, twice what it was a year ago. No case of cholera, small-pox, typhus, or epidemic meningitis was reported, but 880 persons died from suicide, 43 were murdered, and there were 658 fatal accidents. The number of medical practitioners in the city was 4519, or 468 more than in 1924 (an increase of 11·5 per cent.), and 110 more than in 1926 (an increase of 2·8 per cent.). For the whole of Austria the increase was 872—i.e., 12·2 per cent. over the figure for 1924, or 4 per cent. over that for 1926. The mortality in Vienna was 14 per 1000 in the population as a whole, but for the medical profession the rate was only 9·8. A marked increase in the mortality figures was caused by the rapid spread of diphtheria and measles last year, especially amongst school-children. Whereas in 1926 only 99 persons succumbed to diphtheria, last year the figure rose to 198, and against 9 deaths from measles in 1926 there were 133 in 1927. Therefore the Board of Health is urged to reconsider its previous order which abolished the necessity of notifying measles to the district officer of health, and is recommended to introduce one of the numerous methods of prophylaxis against this disease.

Diseases of Over-feeding.

Dr. Kollert discussed recently in the Medical College for Post-graduates the problem of conditions produced by excess of food. He said that in eclamptic uræmia fat is excreted in the urine, and œdema is very often noticeable. During the later part of the war, when there was a scarcity of fat in the daily fare, fat in the urine, as well as uræmia eclamptica, was almost unknown here, although there were numerous cases of nephritis. With reappearance of fat in the daily food the old conditions returned. Cirrhosis of the liver was also very rare during that period, whilst diabetic troubles and Graves's disease became much less common. Observations amongst primitive races seem to prove that an almost exclusive meat diet predisposes to early arterio-sclerosis. Over-feeding with vitamin B, he believes, distinctly encourages enlargement of the spleen and lymph glands—the "lymphatic habitus" of the older writers, who already suspected faulty feeding as a causal factor in this condition. Excess of vitamin D, he said, seems to promote calcification of the large blood-vessels. But all these relations are not yet thoroughly investigated, and only one fact stands out clearly—namely, that diseases run a different course according to the kind of feeding which the patient had before his illness.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

The National Insurance Bill.

AFTER many years of contemplation a Bill providing for national insurance has been introduced to the Commonwealth Parliament. In 1923 a Royal Commission investigated the problem but the present proposals are only approximately based on the recommendations of that Commission. Financial provision is made against sickness, disablement, widowhood, orphanhood, and superannuation. Medical benefit is not included. Workers who have a total income exceeding £416 will not come under the terms of the Bill. Sickness allowance of £1 7*s.* 6*d.* per week is payable to male adults, £1 per week to female adults, and 15*s.* per week to minors unless married. After 26 weeks the maximal allowance is reduced to £1 per week. In the event of death the widow would receive £1 per week for at least three years, and 5*s.* for each child under the age of 16 years. A superannuation allowance of £1 per week is payable at the age of 65 for males and 60 for females. The contributions that will entitle the insured person to these benefits will be 1*s.* per week, plus a further 1*s.* contributed by the employer. Women will each contribute 6*d.* It is stated that the proposed scheme "will follow the general lines of the British National Insurance," but this does not satisfy the commercial section of the community, who fear that it will be an added burden to industry. Employers have a vivid recollection of a child endowment scheme in New South Wales which was designed to benefit the married men by increasing their wages in proportion to the size of their family, but actually forced the married men out of employment and increased the cost of living.

Throughout Australia there is evidence that voluntary contributions for hospital maintenance

are falling away, so that increased claims are being made on public funds. The grants per bed to hospitals, from the funds of the respective State Governments at the present time, are: Victoria £45, Western Australia £83, New South Wales £99, Queensland £102, Tasmania £105, and South Australia £149. Victoria endeavours to increase the voluntary contributions to hospitals by means of a central fund known as the "Lord Mayor's Fund." During the financial year 1927–28 the total amount collected by this organisation amounted to £61,642. Queensland conducts a State lottery in the interests of the medical charities. For the financial year 1927–28 the disbursements from this source amounted to £335,610.

The function of the Victorian Bush Nursing Association is to provide trained and resourceful nurses who will undertake general nursing, obstetric, first-aid, and child welfare work. It was started in 1911 and there are now 59 bush nursing centres in Victoria. Considerable interest has been aroused by the records of the obstetric work of the Association.[1] For the past 12 months 792 cases were delivered without a single death. Antenatal supervision was given in 715 of these cases.

A Noise Abatement League has been founded in Melbourne. One reason for this is that the Melbourne Hospital is situated almost in the centre of the city, and the traffic noises in the surrounding streets are considerable. An intending benefactor of some importance has stated that he is not prepared to give a large donation to the hospital unless steps are taken to remove the tram lines from the contiguous streets. The Tramway Board has given the request serious consideration, but there are tremendous difficulties in the way. The situation has revived local controversy about the desirability of placing a general hospital in the centre of a city.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

A Source of Tropical Drugs.

INDIA has a source of great potential wealth in its home-grown drugs, an industry which only requires the attention of the people to develop on economic lines. The chemist and the pharmacologist can help in different ways. Many of the drugs used in Europe and America, for which some sort of standard has been laid down, grow in various parts of India. Chemical or biological assay of all these can be gradually made and their value relative to those growing in other parts of the world ascertained. It will be necessary not only to assay the plants growing wild in different parts of India, but also to find out their seasonal variation and the soils in which they grow best. Russian artemisia growing wild has been found to have a santonin content of less than 1 per cent., which is increased by cultivation to nearly 3·6 per cent. Russia accordingly at present is the best source of santonin, but artemisia grows wild in some parts of the Himalayas, in Baluchistan, and in the Hindu-Kush mountains. India could supply the whole world with santonin if only a little attention were given to its cultivation. Digitalis leaves or preparations used to be imported in large amounts into India. It has recently been shown that the drug deteriorates during transit or storage, and that to secure an active preparation it is desirable to get fresh leaves from Indian sources. Digitalis leaves of excellent quality are now being grown in different parts of India, and the Indian drug is gradually coming into wider use.

Again, *Ephedra vulgaris* grows wild in many parts of Northern India, and recent work on this indigenous plant has led to a demand for it outside India. America alone ordered 34 tons of ephedra during 1928. Taking the minimum yield of 0·5 per cent. of ephedrine, the alkaloid extracted from 34 tons would be worth (at current prices) nearly four lakhs of rupees. Should further knowledge lead to the wider use of ephedrine in medicine India will be a rich source of the drug. In numerous other instances a little initiative would give rise to increased export and increased cultivation. The extraction of some of these drugs in local factories would probably prove more economical than the export of the crude material. Thus the manufacture of caffeine from tea-dust or of strychnine from nux-vomica seeds are examples of substances whose manufacture in India has proved economical in spite of the high cost of solvents bought from abroad. But the demand for solvents would in turn lead to other industries for their manufacture.

The Mentality of Prisoners.

Lieut.-Colonel F. A. Barker, I.M.S., Inspector-General of Prisons in the Punjab, remarks that the study of the mentality of Indian prisoners provides an untouched field for research work. Discussing the value of psychology in dealing with the gaol population, in the quarterly *Bulletin* of the Indian Association for Mental Hygiene, Colonel Barker quotes the typical instance of a prisoner now confined in one of the Punjab gaols. During his prison career he has been punished over 300 times, and owing to the exasperation caused by his conduct in the minds of his guardians he has been transferred in turn from one gaol to another until he has visited most of the prisons of the province. The only gaol administration in this country which has attempted the study of mental defectives is that of the Madras Presidency where a special gaol has been set apart for such cases at Cuddalore. The convict population of this gaol at the end of last year numbered 335, of which a large proportion were either mental defectives or recovered lunatics. The superintendent is a medical officer specially trained in mental disorders and he pays individual attention to every case. Work and discipline are both light and the irksomeness of confinement is reduced to a minimum. Apart from the advantage to the mental defectives themselves, this segregation is beneficial to the other gaols, which are relieved of the handicaps to discipline and labour occasioned by the presence of this troublesome class.

New Bombay Hospital.

Sir Leslie Wilson, the Governor of Bombay, in laying the foundation-stone of the Sir Cowasji Jehangir Ophthalmic Hospital, paid a handsome tribute to the munificence of the Parsee community. The hospital fund associated with the founder's name has reached a total of 17½ lakhs of rupees. No other equally small community in any part of the world, said Sir Leslie, could show such a proud record, and the city owed an immense debt of gratitude to those early Parsee pioneers who laid the secure foundations of the city in trade, commerce, and communications with foreign countries, and whose successors ungrudgingly poured out their acquired wealth for its benefit.

Women Surgeons for Soldiers' Wives.

Under existing military regulations, wives and families of Indian soldiers are entitled to medical attendance at their quarters by the officer in medical charge of the unit to which the man belongs, or by a subassistant surgeon. As most of the wives of Indian soldiers observe the purdah, medical officers find it difficult to see them when they are sick. It has been decided, therefore, to appoint female sub-assistant surgeons as an experimental measure, and six are to be employed, in the first place, at the more important military centres in order to give the scheme a practical trial.

[1] See THE LANCET, 1927, ii., 1352.

EPSOM COLLEGE SANATORIUM.

SECOND LIST OF CONTRIBUTIONS.

A YEAR ago we published a description and plan of the new sanatorium which it is proposed to build to replace the present old-fashioned sick house and the temporary wooden isolation block. The plans drawn by the architects, Messrs. W. A. Pite, Son and Fairweather, showed a two-storey building, with accommodation for 50 boys, designed on the most modern system of hospital construction. The estimated cost of the sanatorium is £26,000, and as soon as £15,000 is in hand the Council of Epsom College will proceed to erect the buildings. The list of subscriptions published last year amounted to £4207 19*s.* 6*d.* Since that date the following subscriptions have been received, making a total of just over £5300.

	£	*s.*	*d.*
Adams, Dr. E. L.	25	0	0
Addison, Oswald	100	0	0
Baker, Dr. Thomas, O.B.E.	1	1	0
Baly, Dr. C. F. Peyton	3	3	0
Bell, Mrs. Theodore	1	1	0
Brixton and Streatham Medical Book Society	2	2	0
Brown, Dr. J. Percival	1	1	0
Bunbury, Dr. E. G.	1	1	0
Bush, Colonel J. Paul, C.M.G. (stock)	79	5	11
Cambridge Medical Society	5	0	0
Carden, Dr. William A.	10	10	0
Clayton, Dr. E. B.	2	2	0
Cunningham, Andrew	5	5	0
Drake, Dr. J. A. (second contribution)	1	1	0
Dunbar, Dr. Henry J., O.B.E.	5	5	0
Gotla, Dr. Framjee	1	1	0
Griffin, Dr. F. W. W.	2	2	0
Hampstead General Hospital, Hon. Medical Staff of	100	0	0
Handley, W. Sampson	10	10	0
Heald, Dr. C. B., C.B.E. (second donation)	5	5	0
Highton, H. C.	26	5	0
Jenkins, G. J., O.B.E., F.R.C.S.	5	5	0
Jessop Hospital, Sheffield, Medical Staff of	5	5	0
Kirkwood, Dr. William Douglas	1	1	0
Knight, Dr. R. H.	2	2	0
Morris, Dr. A. L.	1	1	0
Morris, Dr. Claude W., O.B.E.	5	5	0
Mugliston, Dr. T. C.	2	2	0
Neild, Dr. F. M.	2	0	0
Palmer, A. C., O.B.E.	5	5	0
Penrose, Dr. Frank G.	2	2	0
Pendlebury, H. S.	21	0	0
Richards, Dr. H. A.	1	1	0
Richardson, Mrs. S. M. V.	5	0	0
Roberts, Dr. Ffrangcon	5	5	0
St. Bartholomew's Hospital Medical Staff	200	0	0
Selby, Dr. Prideaux G., O.B.E.	10	10	0
Slater, Dr. Charles	5	0	0
Smith, Dr. F. W. W.	5	0	0
Surrey Branch of B.M.A. (further donations)	8	15	0
White, Sir William Hale, K.B.E., M.D.	20	0	0

Public Health Services.

CHANGES IN NATIONAL HEALTH INSURANCE LAW.

AMONG the changes in the law of health insurance which took effect at the beginning of the year are several of interest to the managers of hospitals. A new provision, substituted for Section 26 of the principal Act of 1924, authorises approved societies (subject to the consent of the Minister of Health) to subscribe or contribute to hospitals, dispensaries, and other charitable institutions or for the support of district nurses; such sums are to be treated as expenditure on benefits. Section 75 of the principal Act, dealing with schemes for the disposal of surpluses, is amended to allow the disposable surplus, up to such maximum amount as may be prescribed, to be applied in occasional donations to hospitals, dispensaries, charitable institutions, and district nursing funds and also "for the purposes of medical research to institutions approved by the Minister." Charitable institutions are significantly defined as any which the Minister is satisfied are ordinarily and to a substantial extent supported from sources other than public funds and payments out of funds of approved societies. Other new provisions arrange for continuing in insurance persons who cease to be employed (in place of the previous free year and prolongation arrangements), for deposit contributors, married women, and seamen. There are amendments, too, as to the management and accounts of approved societies and as to the inmates of hospitals. The 1928 Act mainly follows the Majority Report of the Royal Commission issued in February, 1926 (Cmd. 2596), but it ignores the Commission's recommendations for abolishing insurance committees and for partly pooling future surpluses of approved societies in order to finance an extension of insurance medical services. A new statutory list of "additional benefits," including dental and ophthalmic treatment, is substituted for the old list in the third schedule to the 1924 Act, and the Minister is empowered to make regulations governing the administration of schemes and of additional benefits and the arrangements for providing service or appliances towards the cost of which payment may be made by way of additional benefit. There is a modification of the conditions (contained in Section 24 of the 1924 Act) governing the administration of medical benefit. After a date to be prescribed, and except as authorised by regulations, persons (other than nurses or other hospital employees) will be restricted in respect of making their own arrangements for receiving medical treatment and attendance by way of participating in collective arrangements made through any system or institution. In this connexion it may be noted that the Minister of Health has just published new National Health Insurance (Medical Benefit) Consolidated Regulations, dated Nov. 26th, which revoke and replace the Consolidated Regulations of 1924 and seven subsequent sets of amending regulations.

This tidying process simplifying study of the regulations is in contrast to what has happened to the statutes. The Act of 1928, partly described above, sadly disturbs the neat text of the Consolidating Statute of 1924. Like the Unemployment Insurance Act of a year ago, the form of which roused Sir John Simon and Lord Carson to such vigorous protests in Parliament, the National Health Insurance Act of 1928 is an incomprehensible document in itself. The would-be student must take a copy of the principal statute and, with scissors and paste, snip out the dead matter and insert the new matter, much of which is inconspicuously presented in what the draftsman calls a Schedule of Minor Amendments. If, however, the statute book must be amended, this method of making direct alterations of specified passages is probably the simplest if the student is patient enough to work out the changes.

REPORTS OF MEDICAL OFFICERS OF HEALTH: A SURVEY OF 1927.

IN the course of last year we summarised something like a hundred annual reports of chief health officers for the year 1927, affording material for a hygienic survey of a considerable portion of the population of England, Wales, and Scotland. 1927, it may unthankfully be remembered, was a wet, cold, and sunless year.

General Sanitation.

Some progress was made in the *housing* problem, and most districts report that there is now accommodation available for the artisan and higher-paid worker, if he is willing to pay a higher rent. There is still little chance for the poorest workers and the big families. A few districts have done something in the matter of slum clearance. We are, in fact, just reaching the greatest difficulty of the problem—viz., the clearance of the slums and the provision of

houses for those who cannot pay the rentals which have to be charged for municipal houses.

There are many complaints as to the want of control of building. Houses may be erected where there are no drains and no roads for access. "Ribbon building" along the arterial roads is frequently inharmonious and destroys the beauty of the countryside. Suggestions have been made that new houses in the country should be built in clusters off the main roads.

In some districts renovation is carried out successfully in the default of the owners. In others the houses are too old and worn out for this treatment. Several medical officers favour Octavia Hill methods; others would like to see more effort to adapt municipal houses to the size of the family, so as to avoid subletting. One suggestion, to meet the wants of those most in need, is that some of the municipal houses should be let by the Health Committee with regard to the requirements and capacity to pay of the tenants, while the bulk are let on more or less business lines by the Housing Committee. From several districts come complaints as to the nuisance from tents, vans, sheds, and other makeshift houses.

The Housing (Rural Workers) Act, 1926, has been welcomed by many county medical officers, but the work done during the last half of 1927 was largely preliminary.

Scavenging.—New salvage schemes have in some cases caused adverse comments as to the handwork involved. In some districts there is also a difference of opinion between the medical officer and the surveyor as to the suitability of the maxim, "Burn your own refuse," seeing that house fires are not adapted for the purpose like the furnaces of a destructor.

Water-supply.—Many of the country districts are unsatisfactorily supplied, especially in the dairying counties. The need for some system of national pooling is obvious.

Smoke Prevention.—The new Act is being taken seriously, and has undoubtedly stirred up interest. Regional smoke advisory committees are in the air, and at least one executive committee has been formed—for Sheffield and Rotherham. More consideration is being given to smokeless fuel. Glasgow, Salford, and Halifax, amongst others, have paid special attention to this matter. In nearly 2000 of the Hull municipal houses the "Cookanheat" apparatus has been installed.

Rivers pollution is still in an unsatisfactory position. Notts reports great benefit from the appointment of a whole-time inspector, and that the trades are beginning to take a hand by instigating research. Ultimately no doubt this matter will be taken up by Boards for each river with all its tributaries. One can hardly expect the ratepayers of one county to go to great expense in purifying their rivers in order that the water may be fit for a neighbouring county to drink.

Milk.—The English counties have not, as a rule, instituted veterinary inspection of dairy cows but content themselves with following up tuberculous milk samples, often with very limited success in the discovery of the offending cows. There is no evidence of any lessening of bovine tuberculosis as judged by milk sampling or meat inspection. The Durham County Council have arranged for a scheme of inspection by whole-time veterinary surgeons. Clean milk competitions increase in number and do something to teach the employees, even the older ones, new and cleaner methods. Complaints of bottling milk in the street are quite common, and there is great need reported of a simpler nomenclature for graded milk. A noteworthy matter is the very varying percentage of tuberculous udders found in those towns where regular veterinary inspection of milk herds is in force.

Meat.—From the London meat markets comes an interesting report as to the discovery of bacilli of the avian type in tuberculous pig carcasses. Some 30 per cent. of the specimens examined by Dr. Stanley Griffith and Mr. R. L. Cornell, M.R.C.V.S., were found to be of the avian type, indicating that precautions should be taken to prevent pigs from feeding with infected fowls.

Infectious and other Diseases.

Diphtheria.—Immunisation is being generally adopted for hospital staffs and also for stemming outbreaks in schools and residential institutions. Edinburgh, several London boroughs, and Walsall are using it for the protection of the children generally. The city and county of Aberdeen immunise against both diphtheria and scarlet fever simultaneously on a considerable scale. The virulence test is being more generally adopted in order to set harmless carriers free from restrictions.

Scarlet fever is, as a rule, so mild as not to justify the expense of isolation in hospital, but in Bootle a great increase in severity was noted. Antitoxin for severe cases is becoming generally used, and in a few cases the hospital staffs are immunised.

Small-pox of the mild type has been prevalent in many districts. The few deaths attributed to it have mostly been those of persons suffering from other diseases.

Influenza was very prevalent in the first quarter of the year and swelled the death-rate from respiratory diseases in most districts. Glasgow was an exception and had less influenza than in 1926.

Poliomyelitis was less in evidence than in the previous year but caused a considerable outbreak in Hull with some evidence of case-to-case infection.

Encephalitis lethargica gave rise to fewer notifications but had a higher fatality-rate. Sometimes the deaths equalled or exceeded the notifications.

Rheumatism in Children.—Paddington and Kensington both inaugurated supervisory schemes with compulsory notification. Birmingham and the West Country are also taking up this subject with energy. Bristol has a scheme. Cardiff has been presented with a building, which is to be used as a rheumatism supervisory centre, while Plymouth has a "rheumatism register."

Tubercle.—The lateness of notification is a general complaint, and Salford and Newcastle are among the districts which cannot fill their sanatoriums with early cases. Belief in the efficacy of artificial pneumothorax in selected cases is growing.

Cancer.—Leicester has established a diagnosis clinic at the Royal Infirmary. Several local committees are active, and Manchester reports hopeful research as to the cause of "mule-spinners'" cancer.

Maternity and Child Welfare.

In several districts the newly trained midwives coöperate well in sending their cases to antenatal clinics. It is being more generally recognised that experienced obstetricians are required for the successful conduct of antenatal clinics. During the year Derbyshire made a new appointment of a whole-time woman doctor with special experience in obstetrics and gynæcology to conduct antenatal clinics, supervise and lecture to the midwives, &c. Several districts have followed the example of Hampshire in starting insurance schemes to secure the help of a doctor when needed by the midwife. A very general complaint in the reports is that the pay and status of the midwives are quite inadequate. One large Birmingham firm has arranged that "home helps" may be sent to the homes of their workpeople during the confinement or non-infectious illness of the mother, and has guaranteed the full fee in every case.

Hospitals.

There are many reports of the want of beds in general hospitals. Aberdeen has led the way by absorbing the poor-law hospitals. Many other towns have secured beds in the poor-law hospitals by coöperation with the guardians—e.g., Kensington, Glasgow, Sheffield, Leeds, Reading. The need for hospital treatment of pneumonia is being recognised on all hands. Many county medical officers complain

of the slow progress made in pooling the isolation hospital accommodation in these days when increased transport facilities make it desirable.

Artificial light treatment is being taken up in an increasing number of districts, but the reports vary much as to the benefits obtained.

Health Education of the Public.

This aspect of public health work is exciting more interest, and some novel methods are reported. Thus Plymouth has a Runsyne machine with an illuminated message fixed at a tram terminus, while Salford has window displays at the health office. The Bootle M.O.H. mentions that Merseyside has adopted a joint programme with a whole-time medical lecturer and organiser, but complains that the Ministry do not pay a grant towards the maternity and child welfare and tuberculosis portions of the work.

A REVIEW OF SCHOOL MEDICINE IN 1927.

THE year 1927, judging from the reports [1] of school medical officers, showed considerable advance in school medicine, though it was retarded by the general financial restriction. Closer coöperation was established between the school service and the general public health work, especially that of the infant welfare centres. The medical officer for Swindon remarks that each year it becomes more anomalous to describe the health of the school child separately from that of the general population. Most of the defects and diseases found in school-children arise during pre-school years, and school entrants who have previously attended infant welfare centres have fewer defects than other children.

Coöperation is assisted by having a medical officer working partly at the welfare centre and partly at the school, by having the cards of the welfare centre sent on to the school when the infant becomes an entrant, by making the dental, aural, orthopædic, and other school clinics available for infants, and by the establishment of nursery schools such as those in London, Manchester, and Bradford. At Leeds and in Leicestershire a comparison has been made between the condition of infants who had suffered from the exanthemata and those who had escaped, with the result, somewhat surprising at first sight, that the difference was slight, and such as it was seemed to suggest that attacks of measles and the like actually reduce the tendency to defects in later childhood. This result may be a tribute to the care now spent on infantile ailments. In many areas a feature of the year has been the inauguration of an orthopædic scheme, including the appointment of a consultant surgeon and the establishment of an orthopædic clinic. Often, too, specially trained orthopædic nurses have been appointed to give massage and electrical treatment in the clinics, or as in Cumberland to visit the homes. Coöperating in this work are also voluntary agencies such as the "Tiny Tims" Clinic at Eastbourne or the Cripples Society at Bristol. Another adjunct is the special school for physically defective children and the open-air school. In the preventive work of correcting and guarding against minor deformities much help is given both at the remedial exercises clinic and (in a wide view) by most of the beneficent activities of the organisers of physical training, and it is appropriate that the practice is spreading of including their reports in one volume with that of the school medical officer.

Coördination in orthopædic work is well seen in Hull, where the victims of an epidemic of poliomyelitis were treated in the City Hospital, seen by the consulting orthopædic surgeon, while splints were fitted at the physical defectives school, remedial exercises and massage given at the orthopædic clinic, and a further example of coöperation lies in the fact that in the case of private patients the special facilities at the clinic were offered to the family doctors, and in the great majority of cases accepted. Open-air schools are giving extended proof of their value wherever they are established; notably favourable factors exist at Torquay and Eastbourne. In some of the great industrial cities there is still delay in meeting an urgent need. Dental work is almost everywhere spreading, consolidating, and organising. At Leeds and Stockport, for instance, one feature of progress is an attempt to eliminate the "casual" cases, that is those who only come for treatment when symptoms like toothache are urgent, and to devote more attention to regular and conservative work. In scattered areas like Cumberland a dental van has been found of value. In some areas dental propaganda, better called dental education, is being vigorously carried on. At Cambridge this has gone on to lectures and examinations for elder girls with excellent results.

A pleasing circumstance is the growing appreciation by the school medical officer of the coöperation and help of general practitioners in securing for school-children prompt treatment of their ailments. At Sheffield this applies to the facilities offered for the X ray treatment of ringworm. At Hull it is the orthopædic clinic; at Bristol it is the rheumatic clinic where it is stated that the response of medical practitioners is admirable. Words such as these may be set against what has been called the encroachment of public health enterprise on private medical work. If inroads have been made on the work and earning capacity of the private practitioner their locus has been for the most part that no-man's land of conditions for which treatment was not hitherto generally available—e.g., refraction of the eye and X rays. There is some truth, too, in the statement that the work of welfare centres and school doctors has attracted the attention of parents to the health of their children, and has thus led them to seek private medical advice more frequently. However this may be, it must be remembered that the private practitioners form the backbone of the profession, so that friction between them and their colleagues in the public health service would be disastrous.

The rheumatic clinics prominent in Bristol and in London, where there is increasing hospital accommodation, are of great importance in preventing invalidity, loss of working time, and premature death in later life.

[1] See THE LANCET, 1928, ii., 37, 93, 328, 501, 1147, 1311.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 22ND, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 201 (last week 176); scarlet fever, 2451; diphtheria, 1350; enteric fever, 31; pneumonia, 1481; puerperal fever, 43; puerperal pyrexia, 95; cerebro-spinal fever, 2; acute poliomyelitis, 3; encephalitis lethargica, 22; dysentery, 11; ophthalmia neonatorum, 108. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified in the following 16 counties: London, 6 (Battersea 1, Lambeth 4, Poplar 1); Chester, 3 (Ellesmere Port and Whitby); Derby, 23; Durham, 34 (of these, South Shields 11, Jarrow 14); Essex, 13 (East Ham 4, West Ham 9); Huntingdon, 1 (Old Fletton); Lancaster, 15 (of these, Oswaldtwistle 11); Leicester, 13 (county borough); Northumberland, 21 (Tynemouth); Nottingham, 6; Soke of Peterborough, 3; Stafford, 4; Warwick, 1 (Coventry); Yorks, West Riding, 33 (of these, Halifax 25); Glamorgan, 17; Monmouth, 8.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Dec. 25th–26th was as follows: Small-pox, under treatment 17, under observation 2; scarlet fever, 2130; diphtheria, 2098; enteric fever, 16; measles, 44; whooping-cough, 466; puerperal fever, 19 (plus 5 babies); encephalitis lethargica, 73; poliomyelitis, 5; "other diseases," 21. At St. Margaret's Hospital there were 8 babies (plus 1 mother) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was no death from small-pox, 7 (0) from enteric fever, 21 (0) from measles, 7 (0) from scarlet

fever, 52 (12) from whooping-cough, 42 (10) from diphtheria, 65 (13) from diarrhœa and enteritis under two years, and 69 (9) from influenza. The figures in parentheses are those for London itself.

No death occurred from enteric fever, measles, or scarlet fever in London. The fatal cases of enteric fever outside London were reported from Stoke-on-Trent 2, Exeter, West Bromwich, Wallasey, Sunderland, and South Shields 1 each. Stockton-on-Tees and Newcastle-on-Tyne each reported 4 fatal cases of measles, Liverpool and Hull 3 each. (Belfast 7.) Whooping-cough was most fatal in Salford with 6 deaths, Manchester with 4, Plymouth, Warrington, and Leeds with 3 each. Salford reported 6 deaths from diarrhœa, Liverpool and Manchester 5 each, Birmingham 4. The reported deaths from influenza are fewer, but Manchester notified 9.

The number of stillbirths registered during the week in the great towns was 265 (corresponding to a rate of 41 per 1000 births), including 37 in London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. W. N. L. Cherry is placed on the Retd. List with rank of Surg. Capt.

Surg. Lt.-Comdr. K. A. I. Mackenzie to be Surg. Comdr.

Surg. Lt. P. J. A. The O'Rourke to be Surg. Lt. Comdr.

J. M. McNamara and M. J. Brosnan to be Surg. Lts.

The following appointments are notified :—Surg. Comdrs. : A. C. V. Green and J. M. Hayes to *Victory*, for Haslar Hospl. ; T. R. L. Jones to *Benbow* : and S. W. Grimwade to *Emperor of India*.

ROYAL NAVAL VOLUNTEER RESERVE.

H. H. Bailey to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. L. A. A. Andrews, half-pay list, retires on retd. pay on account of ill-health, and is granted the rank of Lt.-Col.

Maj. C. Russell, from R.A.M.C., Res. of Off., to be Capt.

TERRITORIAL ARMY.

Maj. H. L. Garson to be Lt.-Col., and to comd. the 170th Cav. Fd. Amb.

Capt. H. G. L. Haynes to be Maj.

Capt. A. L. Crockford (late Gloster R.) to be Lt., and relinquishes the rank of Capt.

Lt. J. R. McDonald to be Capt.

F. A. Bevan to be Lt.

INDIAN MEDICAL SERVICE.

Col. C. Hudson to be Maj.-Gen.

Lt.-Col. S. R. Godkin to be Col.

Temp. Lts. to be Temp. Capts. : Rochiram Udhamdas Hingorani, Janardan Madhav Gole, Cheruvari Kottieth Lakshmanan, and Kundan Lall Jetley.

To be Temp. Lts. : Taqiud Deen Ahmed, Muhammad Jafar, Girdhari Lal Kohli, Bawa Harnam Singh, Ved Vias Puri, and Ellamana Siva Rama Menon.

Lt. Surendra Nath Lahiri resigns his commn.

DEATHS IN THE SERVICES.

Col. Peter Broome Giles, C.B., who died at Folkestone on Dec. 19th last, aged 62, qualified with the M.R.C.S. Eng. in 1871, taking the L.R.C.P. Edin. in the following year. In 1897 he obtained the F.R.C.S. Edin. For a time he was in private practice in Herefordshire, and subsequently went to Buckinghamshire, of which county he was High Sheriff in 1907. He was a J.P. for both counties as well as for Folkestone. Always a keen Volunteer he joined the Artists' Rifles, and later, when attached to the Hereford Volunteers, raised the Welsh Border Bearer Company. On the formation of the Territorial Force he was promoted to the rank of Colonel and was appointed A.D.M.S. to the 1st London Division in 1908. During the war he was Commandant of the Military Convalescent Hospital at Alnwick and afterwards at Ashton-in-Makefield, when he was severely wounded in an air raid. Col. Giles, who was created C.B. in 1911, was a County Director of the City of London Branch of the British Red Cross Society, and held the Volunteer and Territorial Force Decorations. He married, in 1879, Florence, daughter of the late J. C. Houghton, of Quinta Brobury, Hereford, and of London, who, with one son and one daughter, survives him.

Correspondence.

"Audi alteram partem."

SOME ASPECTS OF DENTAL SEPSIS.

To the Editor of THE LANCET.

SIR,—Dr. Tallent Nuthall in his interesting paper under this heading in your issue of Dec. 22nd, 1928, writes of the "dead tooth heresy" and states that it is a common thing for radiographic reports to lay stress on the vitality of teeth to the exclusion of other points in attempting to estimate the degree of dental sepsis present. I would suggest that in reality there is no heresy, and that any apparent confusion of thought on this particular point exists among those radiologists who so confidently pronounce a verdict on the strength of a set of films or those doctors who so implicitly accept such reports and pass sentence on the teeth accordingly. A competent dentist will only give an opinion on the presence or not of dental sepsis after a consideration of *all* data, of which the radiological is only a part, and not always the most important part. He may often find it very difficult to decide whether there is any sign of infection, and still more, whether teeth should be saved or extracted, but if he knows his pathology he will not have any difficulty in estimating correctly the significance of the pulpless tooth.

As Dr. Nuthall truly states, there are two main forms of dental sepsis : pyorrhœa alveolaris, in which the infection starts at the gum-margin and extends deeply into the bone, and apical infection, in which the infection follows death of the pulp and, passing through the apical foramen, infects the periapical bone. In the first form, pyorrhœa, the dental tissue affected is the periodontal membrane. The pulp, though it may early show signs of degeneration, may remain alive until a late stage of the disease. The gravity of pyorrhœa is estimated by the depth of the pocket, the presence of pus, and, radiographically, by the bony changes. The question whether the pulp is dead or alive has little bearing on the problem of treatment. It is obvious that a pyorrhœic tooth which is also dead has lost so much of its nutrition that its life in any case is limited, but since the majority of the teeth in pyorrhœa are actually vital the decision as to the treatment must be decided primarily by a consideration of the bony changes. Those who would extract dead teeth only (it is inconceivable that there should be dentists among them) would therefore ignore pyorrhœa as a cause of dental sepsis, a reductio ad absurdum !

In the second form of dental sepsis, apical infection, the actual path of the infection postulates the death of the pulp. If it is vital (with rare exceptions which cannot be considered within the limits of a letter) then apical signs in a radiogram will be absent. Those who advocate procedure 4 (see Dr. Nuthall's letter) must equally advocate procedures 2 and 3. What I suppose Dr. Nuthall *may* mean is that a certain school of thought, which has found its most vocal expression in America, has advocated the extraction of all pulpless teeth as a routine measure irrespective of whether they show radiographic change or not on the grounds that they may be infected without radiographic signs, or if not infected they may become so later, and in any case they are pestilent fellows better out of the mouth. This is, indeed, a crude and unscientific procedure which has happily not found much support in this country. It is by no means clear to my mind that Dr. Nuthall is referring to this school, and since his paper may be misconstrued and appears to exhibit some confusion of thought on the pathology of dental sepsis, it appears desirable to make clear that he is really flogging a dead horse, for everyone should know that in pyorrhœa the vitality of the teeth is a minor matter and in apical infection death of the pulp is so necessarily

antecedent to the apical changes that we can take it for granted.

We sadly need accurate criteria as to the indications which demand extraction of teeth because of some general condition, for it must be a distressing reflection to every conscientious dentist that when he decides to extract teeth not in themselves painful and often highly functional he is in effect carrying out a clinical experiment on his patient which involves a mutilating operation, and may frequently fail to improve the general or local condition for which the extraction was prescribed.

I am, Sir, yours faithfully

Brook-street, W., Dec. 28th, 1928. A. T. PITTS.

ASTHMA RESEARCH COUNCIL.

A NATIONAL APPEAL FOR FUNDS.

To the Editor of THE LANCET.

SIR,—In March of last year you were good enough to publish (THE LANCET, 1928, i., 561) the scheme of investigation and research proposed by the Medical Advisory Committee, to be carried out when the financial support of the Asthma Research Council permitted. During the last nine months this Committee has obtained the coöperation of many physicians in the provinces and the consent of their local hospitals to the formation of research centres, when these can be financed by the Council. By means of grants made by the Halley Stewart Trust and the Medical Research Council an asthma clinic and research centre has already been formed at Guy's Hospital to continue Dr. G. H. Oriel's investigation into the biochemical causation and treatment of asthma, and to supplement and control the results of such treatment by comparing them with those obtained by other methods. A second grant by the Halley Stewart Trust has been given for the study of the characteristics of asthma occurring in childhood; and a special clinic is now being organised at Great Ormond-street Hospital to carry out this work. A research Fellow, endowed by the British Humane Association, has already visited many continental spas and is now investigating the results of the physico-therapy methods there employed by means of apparatus installed by that Association. In order to obtain fuller statistics concerning hereditary influences on this disease and on the general asthma syndrome, family history forms have been approved and printed. They can be obtained from the medical secretary; and the Medical Advisory Committee trusts that medical men will assist the inquiry by circulating them among suitable asthmatic patients. The Asthma Research Council itself, having meanwhile been strengthened and reorganised, will inaugurate a national appeal for funds at a Mansion House meeting at 3 P.M. on Jan. 15th. The Lord Mayor will preside and Sir Humphry Rolleston, Dr. A. F. Hurst, Colonel F. E. Fremantle, M.P., and Mr. Ben Tillett, among others, will speak. The attendance of medical men will be much appreciated.

The Council desires to raise a sum of £50,000, and donations should be forwarded to the Hon. Treasurer at the Council's office.

The personnel of the Medical Advisory Committee is as follows: Dr. A. F. Hurst (Chairman), Prof. R. J. S. McDowall (Vice-Chairman), Dr. H. W. Barber, Dr. L. S. T. Burrell, Dr. E. A. Cockayne, Dr. John Freeman, Dr. R. D. Gillespie, Mr. V. E. Negus, Dr. S. Gilbert Scott (London); Dr. James Adam (Glasgow); Dr. John Hay (Liverpool); Sir Thomas Houston (Belfast); Dr. W. E. Hume (Newcastle); Dr. R. Cranston Low (Edinburgh); Dr. J. A. Nixon (Bristol); Dr. F. E. Tylecote (Manchester); Dr. G. W. Watson (Leeds); Dr. W. H. Wynn (Birmingham).

I am, Sir, yours faithfully,

T. T. JEANS,
Surgeon Rear-Admiral (ret.), Secretary, Medical Advisory Committee.
Asthma Research Council, 42, Ranelagh-road, S.W.,
Jan. 1st, 1929.

RESTRICTED DIETS OR INSULIN?

To the Editor of THE LANCET.

SIR,—The strong influence of American authors upon our outlook on diabetes has somewhat overshadowed the work on this subject being done in Germany and Austria. It may be worth while, therefore, to call attention to the views of Prof. Wilhelm Falta, of Vienna, some of which he has recently summarised.* During more than three months spent in Vienna as Radcliffe Travelling Fellow I have had the chance of studying these methods to some extent and of comparing them with our own, and it is a great pleasure to be able, with Prof. Falta's permission, to review briefly some features of his important work.

Prof. Falta—to whom we owe the introduction of the "Mehl-Früchte-Tage"—bases his treatment of diabetes upon this fundamental object—to give back to the diabetic patient the active, happy, *unrestricted* life of a normal individual. From this follows the simple principle that "insulin should be given whenever we are unable to maintain the nutrition and the bodily and mental activities at a *normal* level without it"; and further, "by means of insulin treatment of diabetes, all extreme forms of diet have become unnecessary, and in general a diet should be given of normal composition in which the individual peculiarities of the patient can be readily allowed for." He thus believes that a diabetic should be dieted like a normal individual and considers that insulin treatment offers us a perfect form of substitution therapy.

Such views are, of course, in direct opposition to those of many authorities, notably of Joslin[1] in America, and in the main to the methods at present employed in England. These methods are based on a belief that the diabetic organism is at fault in more ways than in merely having an inefficient insulin mechanism, and that under all circumstances the patient's diet should be to some extent restricted. The assimilative power of the diabetic organism is supposed to be limited not only in respect of carbohydrate (preformed or potential), but also in respect of total calories as such; and it is believed that any harmfulness of excessive food, especially fat, in diabetes (Joslin) consists pre-eminently in an overload of the total metabolism.

At the same time attention is perhaps too often directed to the disease rather than to the patient. Even should the views of Joslin,[1] Rabinowitch,[2] and others be confirmed, that high diets in diabetes, —though covered with sufficient insulin dosage— exercise a detrimental effect upon the disease, we must, nevertheless, consider whether happiness is not so important to the patient that it should govern our treatment, even at the expense of a possible adverse effect upon the progress of the condition. The psychological effect of constant attention to a restricted diet—an extreme "Minderwertigkeitsgefühl"—is too little regarded, and only too often neglected. If we can restore a normal existence to our patient, and give him the satisfaction of feeling that he is once more a useful member of society, we confer upon him not only a benefit of immense value, but at the same time remove the unfavourable influence that depression, worry, and unhappiness have been shown to exert in diabetes. This has been amply demonstrated by Falta, and the altered mental outlook of the diabetics under his treatment in Vienna is perhaps the most striking impression left after a study of the patients under his care.

The cautions so often urged against giving increased diets with the aid of insulin should especially apply to the diabetes of children. It is in the young, however, that Falta's results are most remarkable, for under

* Neue Probleme des Diabetes Mellitus, Wien. Med. Woch., 1928, lxxviii., 1131 and 1162.

[1] Joslin, E. P.: Treatment of Diabetes Mellitus. London, 3rd edit., 1924.

[2] Rabinowitch, I. M.: Quart. Jour. Med., 1928, xxi., 211.

his régime bodily and mental development proceed as well as in healthy subjects.

For the details of his methods his original papers must be consulted. The chief essential is "schooling of the patient," who must be educated to manage his own diet and taught that his insulin requirements are exactly dependent upon the carbohydrate and protein content of his food. He must know that severe exercise lowers his need for insulin, and that on the first symptom of hypoglycæmia sugar must be taken; he must know that his insulin demand can vary and will lessen with anything that decreases his intake or absorption (e.g., gastro-intestinal disorders); he must be instructed to test his own urine and to increase his dose of insulin when sugar appears. He must be taught, in fact, almost to become his own doctor, though the ultimate control must, of course, remain in experienced hands. That this can be achieved, even with the most poorly educated patients, has been fully demonstrated at Prof. Falta's hospital clinic. Carbohydrate is allowed to about the equivalent of 8 oz. of bread (i.e., 160 g. carbohydrate), and protein to about 100 g., and fats are taken in the amounts that a normal individual would himself choose. "It is purely technical difficulties that prevent me from giving 300 to 400 g. of carbohydrate, although 200 g. of bread-equivalent are in fact sufficient," writes Falta, "and I know of no single reason which under ordinary circumstances should cause us to depart from the dietetic principles applicable to normal man; in fact, every departure has its disadvantage; and though complications may demand variation at times, I aim as soon as possible at a normal diet." Investigations over a long period have convinced him that restricted diets are inefficient, and that removal of sugar and acetone by dietetic means is too often bought at an excessive price. The one-sided diets, such as Petrén's vegetable and fat diet, he regards as unnecessary and often impracticable, and the restriction of carbohydrate and ordering of fast-days—still so firmly advised, despite the introduction of insulin—are, in his opinion, errors of treatment based purely upon theoretical considerations. Fast-days merely upset the insulin dosage, and lower diets limit the bodily nutrition and thus the capacity for exertion. No procedure that threatens the state of nutrition is permitted, and exercise with its beneficial effects upon the sugar tolerance is in every way encouraged. Falta's careful investigations have shown that variations between 100 and 200 g. of fat do not cause any change in the insulin requirements of the diabetic or the output of sugar in his urine, and the work of Widmas,[3] who has emphasised the value of high caloric diets and the negligible influence of fats upon the blood-sugar, supports this view. Thus, with sufficient carbohydrate in the diet, and corresponding dosage of insulin, very large amounts of fat may be utilised without formation of ketone bodies, and man's natural regulator—the appetite—may be allowed to control his caloric intake. Joslin's view that the safest quantity of fat for the diabetic is as little above 50 to 100 g. as possible, must, in the face of Falta's results, be seriously questioned (compare also the work of Wagner [4]).

Adequate insulin dosage may restore efficiency to the islet organ as rest may restore it to the decompensated heart; in cases of acute overstrain of the carbohydrate mechanism ("Ueberlastung und Erschöpfung") such return of function may occur. In some cases, however, the insulin requirements gradually increase (progressive cases); in others they remain for many years stationary. Therefore, the patient's question, whether if he once starts insulin he will ever be able to leave it off, can only be answered with the lapse of time. That actual regeneration of the Langerhan's cells takes place—as some animal experiments lead us to suppose (Herring [5]; also Boyd and Robinson [6])—Falta thinks to be in some cases highly probable. Thus tolerance will often surprisingly improve under his régime, and the increasing good health of his patients, combined with systematic muscular exercises, is often accompanied by much diminished insulin requirements. When the dose, however, has to be raised to 80 or 90 units daily to cover his standard diet, containing approximately 160 g. of carbohydrates, it is thought to represent substitution for a completely degenerate and functionless islet organ, and there can be little hope of any lessening in the need for insulin. Temporary so-called insulin-resistant cases due to increased irritability of the nervous system, or to complicating infectious disease, may also, of course, require equally high dosage.

Falta has thus shown that by a rational nutrition with insulin everything can be attained that is demanded from a substitution-therapy. That his results have justified his technique is amply demonstrated by his patients. Expensive, one-sided, and troublesome diets, which are often almost impossible to maintain in ordinary society, are for the patient abolished, and for the doctor a constant and wearying process of dietetic calculations is replaced by a short period of interesting instruction. The treatment of the diabetic lies with the patient, in his own hands and in his own home. It must, however, be emphasised that superior medical control is essential, and that no tendency to over-indulgence in food or to abandonment of due care by the patient or doctor is in any way suggested.

I am, Sir, yours faithfully,

Dec. 8th, 1928. T. C. HUNT.

[3] Widmas, K.: Études sur le Diabète Sucré chez l'Enfant. Acta Pædiatica, vol. viii., Suppl. 1, Upsala, 1928.

[4] Wagner, R.: Wien. Klin. Woch., 1927, xl., 1 (Sonderbeil, 41).

[5] Herring, T.: Quart. Jour. Exp. Phys., 1927.

[6] Boyd, G., and Robinson: Amer. Jour. Path., 1925, i., 135.

MEDICAL FOUNDATIONS:

A PLEA TO TESTATORS.

To the Editor of THE LANCET.

SIR,—During 1928 I have seen in the press particulars of the wills of fully ten or a dozen medical practitioners who obviously, from the details given, had no dependants. Large sums were bequeathed to various deserving charities, but nothing at all to those charities which should have the first call on members of the profession—that is, Epsom College and the Royal Medical Benevolent Fund.

The bulk of us, of course, have to think first of our families when making a will, but to those who have none, I urge the duty of preference to the proper charities of our own profession. At Epsom College the Council are engaged on the uphill task of collecting money to build a new sanatorium. After a year and a half of effort about one-fifth of the large sum required has been obtained. A few good legacies would enable a start to be made with this most necessary improvement: a fortiori, from those who can afford them, immediate contributions of any size will be most gratefully accepted.

I am, Sir, yours faithfully,

HENRY ROBINSON.

Bramham-gardens, S.W., Dec. 30th, 1928.

SURGICAL ACCESS TO THE BRAIN.

To the Editor of THE LANCET.

SIR,—In your issue of Dec. 8th, 1928, we find on page 1193 an editorial on Surgical Access to the Brain, in which you seem to make a sweeping statement that up to and until the present there has not been a satisfactory means of access to the brain. We therefore enclose to you a bulletin showing the Albee electrically operated instruments which, we believe, are recognised through the world as the most advantageous appliance for this work available, as many of them are sold throughout Great Britain, in fact throughout the world. Thousands of them are in use in America.

On page 1177 of the same issue, Mr. W. H. Ogilvie speaks of the apparatus available previous to his

invention as expensive in first cost and in repairs. Neither statement applies to the Albee outfit. The Albee outfit is not cumbersome, the sterilisation is eminently satisfactory, the leads need not be draped in towels because they are sterilisable, and the Albee perpendicular saw permits of access to recessed bones much better than the drill illustrated in Fig. 2A (page 1178).

In justice to Dr. Fred A. Albee, a New York City surgeon of international reputation, as well as to ourselves who manufacture the Albee instrument exclusively, we feel a correction of these statements is due. We are, Sir, yours faithfully,

THE KNY-SCHEERER CORPORATION OF AMERICA.

Dec. 21st, 1928.

*** We can find no such statement in the leading article. It is expressly stated that there is now on the market, for opening the skull, excellent electrically driven apparatus, which can be sterilised and the speed of which can be readily controlled.—ED. L.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT BILL.

(*Continued from p. 1364 of last issue.*)

ON Tuesday, Dec. 18th, 1928, the House of Commons went into Committee on the Local Government Bill, Captain BOURNE was in the chair. This was the third allotted day under the guillotine resolution.

Clause 13 provides that as from the appointed day it shall be the duty of every county council and county borough council and other local authority to recover from any person who has been maintained by them in any hospital, maternity home, or other residential institution in which accommodation is provided by the council, other than a person who had become an inmate of an institution for the purpose of receiving treatment for infectious disease, or from any person legally liable to maintain that person, the whole of the expenses or such part as the council are satisfied they can pay.

Recovery of Cost of Treatment.

Mr. SIDNEY WEBB moved to omit the words "it shall be the duty of," which made it obligatory on the council to present the Bill for the full amount. He said that that full amount as the clause stood appeared to include the whole cost of all the medical treatment, however expensive that might be. The North Middlesex Hospital, which was under the administration of the Edmonton Board of Guardians, had just obtained the sanction of the Minister of Health for an expenditure of £6000 on radium to bring its equipment up to date. It was better equipped in many respects than a good many voluntary hospitals. The practice there was to recover from the patients as much as the board of guardians thought it could recover up to the total limit of cost, and in that connexion no question arose. The total cost last year was 49*s.* a patient per week. If the institution was handed over to the Middlesex County Council, as it would be, it would mean that the Act would require the county council to present a bill of 49*s.* a week to every patient who used the institution, although in the case of the board of guardians only about 15 per cent. of the patients paid any contribution, and in 85 per cent. practically nothing was recovered. It would be a very serious change to make if, instead of preventing a bill for 5*s.*, 10*s.*, or 20*s.* up to 49*s.*, according to the means of the person in only 15 per cent. of the cases, the local authority should be required to make the full charge of 49*s.* in all cases. If everyone who went into that hospital was told that he or she would receive a bill necessarily at the rate of 49*s.* a week, without some prospect of the amount being reduced, it would be, he was informed by medical people concerned, a very serious deterrent to people going into that hospital at the earliest possible date. A ward was being fitted up with radium at very great expense for the treatment of cancer. Now every poor woman for whose benefit this was being done would be told that she would be presented with a bill for 49*s.* a week if she went into that hospital. That could not fail to be a very deterrent effect on the use of the hospital. It would not be in accordance with the Minister of Health's intentions or desire to make the emphatic change, and to insist that instead of the bill being graduated according to the patient's means the full amount in each case would have to be presented.

Mr. PETHICK-LAWRENCE, who seconded the amendment, drew the attention of the Minister to the case of the unmarried mother. He said that at present whether the unmarried mother was treated in a voluntary hospital, a special nursing home, or in an institution under a local authority, great care was taken to preserve the secrecy which might be necessary in these cases. Under the clause, however, if the woman herself was unable to produce any money, application would be made at once to members of her family—her father, or whoever might be responsible in law for her. The result of that would be that these women would not go into a home or institution to be treated. To-day it was recognised that it was folly not to help people to fight against infections and venereal disease. Could it be suggested that in regard to cancer and maternity and child welfare the position was different ?

Mr. CHAMBERLAIN said that if the amendment were carried they would be exactly where they were at present. Local authorities already had this power. There was nothing in the Bill which said, as Mr. Webb suggested, that the local authority must present a bill for the whole of the expense to a person receiving treatment. It was not contemplated that the local authority should do anything of the kind. They would do precisely what was done now in other cases. They would, through their officers, find out whether a person was able to pay anything, and, if so, how much, and they would make those inquiries before sending in their bill. The object of the clause was to have one rule for both kinds of institutions. If there was not a provision of this sort, the position would be that in the case of a destitute person treated under the poor-law it would be the duty of the local authority to recover the whole of the costs from him, or such part as he was able to pay, but in the case of a person who was not destitute, and was able to pay, there would be a discretion with the local authority. That was a very topsy-turvey state of things, and an anomaly which was being removed by this clause.

Mr. A. GREENWOOD, in supporting the amendment, said that the clause would mean that some of the energy and time of the administration staffs of the public departments would be diverted to the business of collecting money. The Opposition did not so much regard the mere collection of the money as obnoxious, but they thought that the new duty which was imposed on local authorities was bound to be a deterrent, and would lead to numbers of people who ought at an early stage to seek institutional treatment to postpone it or not to go at all.

Dr. VERNON DAVIES said that Mr. Greenwood showed extreme lack of knowledge of the subject on which he had been speaking. Perhaps the hon. Member would allow him (Dr. Davies) as an old medical officer of the poor-law, as a hospital official, and as a general practitioner, to let him know what really happened. In the majority of cases a person who was sick went first of all to his private doctor without any thought of what it was going to cost. The doctor examined him, and if the case required treatment in an institution he sent the man to the institution. In some of the large towns they would find, occasionally, that the patients, instead of going to a doctor, went to the out-patients' department of a voluntary hospital and got some attention there, without any cost at all to themselves. For Mr. Greenwood to say that the Government by this Bill were trying to prevent people seeking medical assistance at the earliest possible moment was to say what was not true, and to put a false construction on the Bill. The people of this country had known for years that they could always get medical assistance either from hospitals, poor-law institutions, or from doctors without any thought of the ultimate cost. Let them take the case of a general practitioner in an industrial district—in the huge majority of cases. That doctor did not ask a patient: "Where is your fee, and then I will tell you what is the matter with you." (Labour cries of "Oh!") Labour Members might speak from rumour or hearsay, but their attitude was a distinct reflection and libel on a most honourable profession. He maintained without fear of contradiction that no man or woman in this country need delay for one moment in getting the most expert advice and the most expert treatment through fear of poverty, or of the cost, and there was nothing in the Bill which would hinder them in the slightest degree. It was absolutely wrong for an hon. Member on the Opposition front bench (Mr. Greenwood) to make the statements which they had heard that afternoon, but he asked hon. Members and the people of the country to notice that this was the policy of the Labour Party, and that the destitute poor should be charged for medical attention but that the public health authorities need not make a charge. They were asking for this—to charge the destitute poor, but not to allow the public authority to do so—and that was a scandal.

After further debate, the amendment was rejected by 236 votes to 130.

(*To be concluded.*)

Obituary.

DAWSON FYERS DUCKWORTH TURNER, M.D., F.R.C.P., F.R.S. EDIN.

Dr. Dawson Turner, who died at Godalming on Christmas Day, was one of the pioneers of radiology in this country. His influence on its development was considerable, and though an original and inquiring mind went far towards fitting him for his work, he had many other admirable qualities that played their part in making his life exceptionally useful.

Born in Liverpool 71 years ago, he came of a learned family, his father being a well-known classic and headmaster, whilst Joseph Hooker, the botanist, was his cousin. The young Dawson Turner was educated at Shrewsbury, and Dalhousie University, Nova Scotia, where he took an Arts degree in 1884. Returning to this country he went to Oxford and later to Edinburgh, graduating in medicine with honours in 1888. Appointment to the resident staff of the Royal Infirmary followed immediately and Turner became house physician to the late Sir James Affleck, thus beginning a lifelong friendship. In accordance with the custom prevailing at that time he proceeded to visit the principal continental medical schools—Paris and Vienna in particular. Even at this early stage his literary talent showed itself, and he published a short book on skin diseases. He was never much inclined, however, towards the practice of medicine except on its scientific side, and his thoughts began to turn towards physics in its relationship to medicine. It was not long before he started teaching medical physics at the Edinburgh Surgeons Hall, and on the publication of Rontgen's discovery he immediately secured an apparatus with a view to studying the importance of this new development as it affected medicine and surgery. With the plant which was installed at his home in George-square he made extensive experiments, and as precautions were then unknown he contracted a severe dermatitis of the right hand which was to cause him suffering for the rest of his life. A growing interest in the new science induced the managers of the Royal Infirmary to establish a medical electrical department, and in 1898 Turner was asked to join Dr. Milne Murray there as assistant, afterwards becoming his successor. Although now well aware of the danger attending it, he was in no way deterred from continuing experimental work, for with the discovery of radium by the Curies in Paris he immediately secured specimens and began work straight away, lending radium for the use of the Royal Infirmary electrical department until the managers secured a small supply of their own. "During the many years I was associated with him," writes one of his assistants at this time, "I gradually came to admire his originality of thought, his great gifts as a linguist, his facility of expression, and his ability to write papers on any aspect of medical electrotherapy. His 'Practical Manual of Medical Electricity' was for many years a standard work—indeed, up to the time of the war. His 'Radium: Its Physics and Therapeutics' was one of the first publications on this subject in the English language. His paper published in 1906 in the *Transactions* of the British Association on the Hæmorenal Salt Index and Efficiency of the Kidney was epoch-making, and by its means many of his colleagues were able to benefit their patients. It would occupy too much space to detail the papers known by me to have been published by my late chief; I never remember a year, unless laid aside by ill-health, when he did not write at least four."

DR. DAWSON TURNER
At the age of 40.

Turner always took great pains in the preparation of his experiments and demonstrations, alike for his classes—which were always well attended—and for the numerous scientific societies to which be belonged. In these preparations his wife was an interested and devoted assistant. His class in physics at the Surgeons Hall was always popular. He did everything he could to keep these lectures up to date and kept up the interest of his students in a way that few lecturers have the knack of doing. In this he was helped by an unusual personality. Six feet in height and of spare build, with the slight stoop of the student, he had a pleasing dignity and courtesy of manner. His face was grave almost to the point of sternness, but this impression was quickly dispelled by his genial smile. His moods were somewhat variable, and at times he was difficult to understand; but at heart he was one of the most kindly of men, having a gift for making and of keeping friends. The progress of his students in after-life was always a matter of great concern to him; their achievements gratified him and he kept in personal contact with a great number of them.

With an increasing disability from dermatitis it was not long before Dr. Turner's general health was undermined, and in 1911 he had to give up his principal duties as medical electrician at the Royal Infirmary. He was, however, able to take charge of the newly formed radium department, and he kept up his association with the institution over a period of some 30 years, during which he was a familiar figure in medical and scientific circles. It was painful to those who knew him well to see him gradually going downhill and more painful still to know that his sufferings were so long drawn out. Before he finally settled in Surrey two sojourns were made abroad, in Madeira and Switzerland, in the hope of improving his health. Neither, unfortunately, had any lasting benefit. "His enforced retirement from professional work and his severance from the Scottish capital were a great grief to him," writes another of his colleagues, "and in his letters he constantly asked for news of Edinburgh affairs and of his friends there. His fortitude through these long years of increasing disablement and suffering are an inspiration to many."

As an example of Turner's pioneer spirit it may be mentioned that he was the first motor owner and driver in Edinburgh. This pursuit originated in his interest for bicycling as a boy, when he was the owner of one of the high bone-shakers and even competed in cycling races. A love of sport in many forms remained throughout his life. At one time a very good billiard player, he had to abandon this pastime owing to increasing difficulty in holding the cue; but he went on playing golf until within two or three years of his death. From his house at Gullane in East Lothian he was able to enjoy the game on three courses—Gullane, Kilspindie, and Muirfield. His golf bag often excited curiosity and even amusement, for it contained only three clubs, but in spite of crippled fingers and failing eyesight he could still surprise opponents who expected an easy victory, for his accuracy was almost uncanny.

Dawson Turner was a good linguist and a keen musician, and was at one time President of the Royal Scottish Society of Arts. He was also an original member and a vice-president of the Rontgen Society.

He became M.R.C.P. Lond. and F.R.C.P. Edin. in 1890, and was also elected a Fellow of the Royal Society of Edinburgh. His wife, with whom he travelled over a great part of Europe, is the daughter of William Barry, of Romford. She coöperated in every part of his work, and at the same time had the sad satisfaction of attending to his wants during the long illness which it had brought about. For many years she shared with him in dispensing a delightful hospitality in Edinburgh and at Gullane.

CLARENCE LESLIE STARR, M.D. TORONTO.

WE much regret to learn of the death, which occurred on Christmas Day, of Dr. Clarence Leslie Starr, professor of surgery in the University of Toronto, and chief surgeon to the General Hospital in that city.

Clarence Leslie Starr was the son of Milton Starr, of Brooklin, Ontario, and was born in Georgetown, Ontario, in 1868. He was educated at the Whitby College Institute and the University of Toronto, where he graduated in medicine in 1890, and became house surgeon to the General Hospital. He then did much post-graduate work at Vienna and various centres in England, France, and Germany, and studied also for a period at the Bellevue Hospital Medical College, the medical school of New York University. While in New York he was interne at the Hospital for Ruptured and Crippled, and was also assistant surgeon in the out-patient department at the New York Hospital, becoming interested in this way in the subject of pædiatrics. Returning to Toronto he commenced practice there in 1896, and in 1897 joined the teaching staff of the medical faculty of the University as demonstrator of anatomy, a post which he held for four years until his election to the staff of the General Hospital and his promotion to be assistant professor of clinical surgery. The foundation of his well-known work in pædiatrics having been laid in New York, he pursued this branch of practice assiduously in the Hospital for Sick Children in Toronto, where he was appointed surgeon while serving on the staff of the General Hospital, and his various contributions to medical journals and to the American Practice of Surgery largely bear upon deformities of the spine. During the war he served, with the rank of lieut.-colonel, as consulting orthopædic surgeon to the C.A.M.C., and his early death is a real loss to that branch of surgery.

Prof. Starr married Annie Louise, daughter of the Hon. John Dryden, late Minister of Agriculture for the Province of Ontario, by whom he had four daughters.

WILLIAM WARWICK WAGSTAFFE, O.B.E., B.M. OXF., F.R.C.S. ENG.

WE have to record the death, on Dec. 27th, of Mr. W. W. Wagstaffe, surgeon to the Radcliffe Infirmary, Oxford, at the age of 42. His father, who bore the same name, was at one time senior assistant surgeon at St. Thomas's Hospital and the son inherited an anatomical and surgical bent. On leaving Charterhouse he went up to New College, Oxford, and was associated with Sir William Osler in a study of the works of the older anatomists, especially of Vesalius. He took a first class in the honour school of Natural Science in 1908 and then went to St. Thomas's Hospital, whence he qualified three years later. After holding the posts of house surgeon, casualty officer, and surgical registrar, he took charge of the British Red Cross Party sent to Greece during the Balkan War of 1913, and on coming back to England he became F.R.C.S. in 1914. Serving with the British Expeditionary Force throughout the late war he reached the rank of major in the Royal Army Medical Corps. He thus gained an immense surgical experience, especially of head injuries, in which he continued to be interested, as was shown by a recent contribution to our columns. For a short time after the war he acted as first assistant in the surgical unit at St. Thomas's Hospital under Sir Cuthbert Wallace. In 1921 he settled in Oxford as a surgeon and acted as demonstrator in the Department of Anatomy under Prof. Arthur Thomson. He was elected assistant surgeon to the Radcliffe Infirmary in 1924 and surgeon in 1927.

Dr. A. G. Gibson writes: "From the beginning of his work in Oxford we felt we had acquired a colleague who could bear responsibility in surgical work. From his continuous surgical experience following qualification he had attained to an easy familiarity with the main difficulties of surgical technique, and he was not given to adventurous surgery. These qualities made him admirably adapted to the surgical work of the Radcliffe Infirmary, which is very heavy, but which requires a conservative policy, for in the support that it receives from country districts heavy surgical risks without the clear possibility of good must be avoided. The writer is reminded of an incident in which Wagstaffe was unwilling to interfere in a case referred to him for operation. The woman had abdominal pain and vomiting which was thought to be due to slight obstruction, but without physical signs. It was characteristic of him that he allowed himself to be persuaded by his senior colleague which as the issue demonstrated was to the benefit of the patient. He regularly attended medical meetings both in Oxford and elsewhere, where he was a frequent contributor of papers and he spoke frequently in discussions. Neither personally nor professionally had he any showy qualities, but he did his surgical work easily and without fuss, and one could not be but impressed with the solid background of common sense which influenced all he did or said. He was simple in speech and very gentle in manner. I have never heard him say an unkind word, I have never seen him annoyed, and in situations in which other men might have made incisive comment he usually preserved a wholesome silence. We have lost one whose friendship was born of goodwill, a friendship that would have ripened as years went on."

Mr. Wagstaffe married in 1916 Margaret, daughter of Mrs. Cuthbertson, of Broughty Ferry, and there are two children of the marriage. His widow and mother will receive the sympathy of all who knew him.

WILLIAM THORNBOROUGH HAYWARD, C.M.G., M.R.C.S. ENG., LL.D.

WE regret to announce the death at Adelaide on Dec. 21st last of Colonel W. T. Hayward, hon. consulting physician to the Adelaide Hospital, and a much respected member of the medical profession in Australia. He was born at Reading on June 26th, 1854, educated at St. John's College, Hurstpierpoint, and the Liverpool School of Medicine. After qualifying L.R.C.P. Irel. and L.M. in 1874, and taking the M.R.C.S. Eng. in the following year, he held some resident hospital appointments before leaving for South Australia in 1878. Settling at Norwood, he soon became attached to the General Hospital at Adelaide, where he was on the full medical staff for a period of 30 years until 1914, when he resigned to join the Australian Imperial Force and was appointed a member of the governing body. He lectured on clinical medicine and materia medica at the University, serving also on the council. He became president of the Permanent Medical Referee Board of the A.A.M.C. (4th Military District) and was a vice-president of the British Medical Association at the time of its Aberdeen meeting in 1914, when he received honorary degrees from the Universities of Aberdeen and Adelaide in recognition of having devoted his great administrative abilities to organising the profession of medicine throughout the Commonwealth. He was 60 years of age at the outbreak of the war, and for three years, 1915–18, was in charge of the Australian Auxiliary Hospital at Harefield. For his services he was made C.M.G. in 1919. Colonel Hayward married Florence, daughter of the late P. H. Burden, of Adelaide, by whom he had one son.

Medical News.

UNIVERSITY OF OXFORD.—At recent examinations the following candidates were successful:—

B.M., B.CH.

Medicine, Surgery, and Obstetrics.—A. R. Bowtell, S. B. Davis, R. M. J. Harper, *G. G. Hill, R. G. Macbeth, D. C. Shields, *Margaret A. L. Herbertson, and *Joyce Wright.

Pathology.—G. H. Bateman, Fairfax Bell, J. F. Brock, J. L. Clapham, Arthur Guirdham, M. A. Hatt, J. C. Leedham-Green, W. H. McMenemey, *J. C. Neely, J. N. O'Reilly, R. S. B. Pearson, B. T. Squires, Anne D. M. Adams, Olive M. Capper-Johnson, Amy C. E. Clarke, and Victoria M. Robinson.

Forensic Medicine and Public Health.—H. R. J. Donald, J. A. Eddy, R. G. Macbeth, H. E. Mansell, *J. C. Neely, J. C. Nicholson, G. P. Roxburgh, W. J. Walter, H. G. Wells, and Ruth Sandeman.

Materia Medica.—P. M. F. Bishop, J. F. Brock, J. M. L. Burtenshaw, E. C. Coaker, W. J. Cotton, R. F. Lomax, and R. L. H. Townsend.

* Received their degrees on Dec. 17th.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful:—

Surgery.—E. A. Johnstone, Manchester and Charing Cross Hosp.; E. A. Lipkin, Liverpool and Charing Cross Hosp.; D. M. Nightingale, King's Coll. Hosp.; A. K. Rama Chandra, Edinburgh; and R. W. Scanlon, St. Thomas's Hosp.

Medicine.—W. S. Ghai, Charing Cross Hosp.; D. H. Haler, King's Coll. Hosp.; K. R. Lundeberg, Minnesota, U.S.A.; K. G. Milad, St. Mary's Hosp.; T. A. P. Proctor, Birmingham; A. K. Rama Chandra, Edinburgh; and H. Tenenbaum, Nancy and London Hosp.

Forensic Medicine.—W. S. Ghai, Charing Cross Hosp.; D. H. Haler, King's Coll. Hosp.; C. K. McCoan, St. Mary's Hosp.; J. H. McGibbon, Glasgow; K. G. Milad, St. Mary's Hosp.; and T. M. White, Bristol.

Midwifery.—W. D. Glynn-Jones, Guy's Hosp.; D. H. Haler, King's Coll. Hosp.; K. G. Milad, St. Mary's Hosp.; B. J. Niall, London Hosp.; K. M. Seedat, Charing Cross Hosp.; and T. M. White, Bristol.

The Diploma of the Society was granted to the following entitling them to practise medicine, surgery, and midwifery: W. S. Ghai, E. A. Lipkin, K. G. Milad, E. A. Johnstone, K. R. Lundeberg, T. A. P. Proctor, W. D. Glynn-Jones, A. K. Rama Chandra, and H. Tenenbaum.

THE death is announced of Sir George McCrae, Chairman of the Scottish Board of Health from 1919 to 1922.

EAST LONDON HOSPITAL FOR CHILDREN.—A clinical afternoon will be held at this hospital, Glamis-road, Shadwell, E., on Wednesday, Jan. 9th, at 4 P.M., when the subject of discussion will be Diseases of the Alimentary System. Medical practitioners are invited (tea 3.45 P.M.).

NATIONAL ASSOCIATION FOR PREVENTION OF INFANT MORTALITY.—A course of lectures on the Early Detection and Prevention of Defects and Disease in Young Children, intended mainly for health visitors, nurses, midwives, and superintendents of infant welfare centres, will be given in the Lecture Hall of the Infants Hospital, Vincent-square, Westminster, S.W., on Mondays, from 6.30 to 7.30 P.M., from Jan. 7th to March 11th. The lecturers will be Dr. F. J. Poynton, Dr. Eric Pritchard, Dr. W. E. Robinson, Dr. A. G. Maitland-Jones, Dr. C. Worster-Drought, Mr. Alan Todd, Dr. Donald Paterson, Dr. Letitia Fairfield, Dr. R. C. Wingfield, and Mr. H. R. Jeremy, Tickets may be had from the hon. secretary of the Association at 117, Piccadilly, London, W.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—At 8.30 P.M. on Friday, Jan. 11th, at the West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, London, Mr. Lindsay Rea will give a demonstration on the Fundus Oculi. This demonstration is limited to 12 persons and is especially designed for candidates for the M.R.C.P. examination. Application for attendance should be made to the Fellowship (Tel.: Mayfair 2236). From Jan. 14th to 25th an intensive course will be held at the National Hospital for Diseases of the Heart. The entry is limited to 20 and early application is therefore desirable. An all-day course will be given at the Queen's Hospital for Children from the 14th to the 26th, and the staff of the Prince of Wales's General Hospital will hold an intensive course in medicine, surgery, and the specialties, primarily intended for practitioners, from Jan. 28th to Feb. 9th (daily from 10.30 A.M. to 5.30 P.M.). A series of lecture-demonstrations in Psychological Medicine will be given on Tuesdays and Saturdays at 11 A.M., from Jan. 29th to Feb. 23rd, at the Bethlem Royal Hospital. Copies of all syllabuses, together with information about the General Course arranged by the Fellowship, may be had from the Secretary at 1, Wimpole-street, London, W.

Mr. Robert Ollerenshaw, clinical lecturer in orthopædic surgery in the University of Manchester and orthopædic surgeon to the Royal Manchester Children's Hospital, has been elected a member of the French Orthopædic Association.

DEVONSHIRE HOSPITAL, BUXTON.—This hospital has received a bequest of £5000 from the trustees of the late Mrs. Ada Mary Cryer, of Rochdale, for the endowment of five beds to be known as the Cryer beds, for the free use of patients of the county borough of Rochdale.

GREENOCK EYE INFIRMARY.—More than 5400 patients were treated at this hospital during the year, 4100 of whom were males. There were 2400 cases of the removal of minute pieces of metal and other substances.

S. R. WILSON MEMORIAL PRIZE.—It is announced by the editor of the *British Journal of Anæsthesia* that the prize of £50 given in memory of Dr. S. R. Wilson for research on inhalational anæsthesia has been awarded to Dr. Florence Violet Stephen, M.Sc., who is at present working at the Manchester Royal Infirmary.

POST-GRADUATE LECTURES AT ROYAL NORTHERN HOSPITAL.—A series of lectures and demonstrations will be held at this hospital on certain Tuesday afternoons from January to April, and will be succeeded by three lectures at the Royal Chest Hospital on Wednesdays in May. A fortnight's special course in gastro-enterology will begin on Jan. 28th, and from Feb. 18th to 22nd an "intensive week" of post-graduate lectures has been arranged, including teaching in wards and other departments during the morning. Notices of the weekly lectures will be found in our Medical Diary, whilst particulars of the special courses and of other post-graduate work may be had from the Dean of the Hospital, Holloway-road, London, N.

Appointments.

DATE, W. ADLINGTON, M.B., B.S. Lond., L.R.C.P. Lond., M.R.C.S., has been appointed Honorary Assistant Anæsthetist to the Royal Devon and Exeter Hospital.

GILMORE, E. R. W., M.B., Ch.B. Manch., D.P.H., D.T.M., Medical Officer of Health at Port Louis, Mauritius.

HEALY, T. M., M.B., B.Ch. N.U.I., Master of the Coombe Hospital, Dublin.

MAQUIRE, T. J. R., M.B., B.Ch. N.U.I., D.P.H., Assistant Medical Officer of Health, Cork.

London Jewish Hospital, Stepney Green, E.: KRESTIN, D., M.D., M.R.C.P. Lond., Honorary Assistant Physician; and MANDEL, L., M.D., M.R.C.P. Lond., Honorary Physician (promoted).

Consideration is being given to the appointment of an additional Ophthalmic Specialist Medical Referee under the Workmen's Compensation Act for the following county courts in Circuit No. 31: Aberayron, Aberystwyth, Cardigan, Carmarthen, Lampeter, Llandilo Fawr and Ammanford, Llandovery, Llanelly, Narbeth and Haverfordwest, Neath and Port Talbot, Newcastle-in-Emlyn, and Pembroke Dock. Applications should reach the Private Secretary, Home Office, Whitehall, London, not later than Jan. 19th.

Vacancies.

For further information refer to the advertisement columns.

Barbados General Hospital.—Jun. Res. S. £250.

Brighton, Royal Sussex County Hospital.—Jun. Asst. Pathologist. £250.

British Pharmacopœia Commission, 44, Hallam-street, W.—Secretary. £500.

Buxton, Devonshire Hospital.—Asst. H.P. At rate of £150.

Central London, Throat, Nose and Ear Hospital.—Two Hon. Asst. Out-patient Registrars.

Chester, Royal Infirmary.—Third Hon. Surgeon.

Doncaster Royal Infirmary.—Second H.S. £150.

Great Yarmouth, General Hospital.—H.S. £150.

Guildford, Royal Surrey County Hospital.—Hon. Asst. Surg.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. £300. Also Anæsthetist. 15 gns.

Hove, Lady Chichester Hospital.—H.P. Also Jun. H.P. At rate of £100 and £50 respectively.

Ilford Emergency Hospital, Ilford, Essex.—Jun. H.S. £100.

Inverness, Northern Infirmary.—H.P. and Jun. H.S. £100.

Lahore, Dental Hospital.—Dental Surgeon. Also Dental Mechanic. Rs.1000–50—1500 and Rs.400–20—800 per mensem respectively.

Leamington, Warwickshire and Coventry Joint Committee for Tuberculosis.—Asst. Tuber. O. £650.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Liverpool, Mill-road Infirmary, Everton.—Res. Asst. M.O. £200.

Llangwyfan, near Denbigh, North Wales Sanatorium.—Third Asst. Res. M.O. £250.

L.C.C., Mental Hospital Service.—Eighth Asst. M.O. £300.
L.C.C.—Temporary Asst. M.O.'s. 30s. per session.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.
London Temperance Hospital, Hampstead-road, N.W.—Med. Reg. 40 guineas.
Lowestoft, S. Luke's Hospital.—Jun. Asst. M.O. £500.
Manchester, Ancoats Hospital.—Res. M.O. £150.
Manchester Royal Infirmary.—Four H.P.'s. Each at rate of £50. H.S. to Aural, Gynæcological, and Ophthalmic Dept. At rate of £50. Also Five H.S.'s. Each at rate of £50.
Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.
Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. At rate of £150.
Metropolitan Asylums Board Mental Hospital Service.—Jun. Asst. M.O. £500.
Nottingham, Bagthorpe Institution and Infirmary.—Res. Asst. M.O. At rate of £300.
Oswestry, Shropshire Orthopædic Hospital, &c.—H.S. £200.
Paddington Green Children's Hospital, W.—Two Hon. Surgeons.
Port Said, British Hospital.—Res. Asst. M.O. £350.
Preston and County of Lancaster, Queen Victoria Royal Infirmary. H.P. £190.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Royal Army Medical Corps.—Twenty-five Commissions.
Royal Northern Hospital, Holloway, N.—Obstetric Physician.
St. John's Hospital, Lewisham, S.E.—Res. Cas. O. Also Jun. House Officer. Each at rate of £100.
St. Paul's Hospital for Diseases of the Genito-Urinary Organs and Skin, Ednell-street, W.C.—H.S. At rate of £150.
St. Thomas's Hospital.—Obst. P. Also Obst. P. in Charge of Out-patients.
Stoke-on-Trent, North Staffordshire Royal Infirmary, Hartshill.—Hon. Asst. Physician.
Staffordshire Mental Hospital, Cheddleton, Leek.—Second Asst. M.O. £650.
Sudan Medical Service.—M.O. LE.780.
Swansea County Borough.—Asst. M.O. £600.
University College Hospital, Gower-street, W.C.—Hon. Clin. Asst. to Ophth. Out-patient Dept.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. Also H.S. Each at rate of £100.
West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Sen. H.P. Also Jun. H.P. At rate of £150 and £100 respectively.
West London Hospital, Hammersmith-road, W.—Aural and Ophth. H.S. and Res. Asst. Cas. O. At rate of £100.
Westminster Hospital, Broad Sanctuary, S.W.—House Anæsth. At rate of £50.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Anæsthetist. £200. Also Specialist Consultants. Special Fees.
Willesden General Hospital.—Clinical Assistants.
Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Lockersbie (Ayrshire) and Llansawel (Carmarthenshire).

Births, Marriages, and Deaths.

BIRTHS.

CORSI.—On Dec. 29th, 1928, the wife of Henry Corsi, F.R.C.S., Harley-street, W., of a son.
MACKAY.—On Dec. 29th, 1928, at Blackheath, the wife of S. Ruthven Mackay, R.A.M.C., of a son.
PYPER.—On Dec. 18th, 1928, at The Old Ford House, Blandford St. Mary, the wife of Major J. C. Pyper, I.M.S., of a daughter.
WIGHT.—On Dec. 27th, 1928, the wife of Cecil H. Wight, *M.C.*, M.R.C.S., L.R.C.P., of Wangford, Lowestoft, of a daughter.
WORSELDINE.—On Dec. 21st, 1928, in London, the wife of Stanley C. H. Worseldine, Captain, I.M.S., of a daughter.

MARRIAGES.

CROFT—LEE.—On Dec. 29th, 1928, at All Saints' Church, Compton, Winchester, Charles Richard Croft, B.A., M.R.C.S., L.R.C.P., to Phyllis Mary, only daughter of Mr. and Mrs. A. C. Lee, of Hatch Thoke, Compton.
GILMORE—FORSYTH.—On Dec. 22nd, at St. Cuthbert's, Withington, E. R. W. Gilmore, M.B., Ch.B., D.P.H. Vict., D.P.H. Lond., D.T.M. Liverp., second son of Mrs. Gilmore, of Fallowfield, Manchester, and the late R. O. Gilmore, LL.B., to Ella, only daughter of Mr. and Mrs. Hy. Forsyth, of Athol-road, Manchester, and of Northsyde, Berwick-on-Tweed.
RUTHERFORD—FLECK.—On Dec. 28th, 1928, at Wilton Parish Church, Hawick, N.B., Andrew Rutherford, M.B., F.R.C.P. Edin., to Mary Rose, widow of James Fleck, C.A.

DEATHS.

HOLMES.—On Dec. 24th, 1928, at Foxhall-road, Nottingham, Dr. T. E. Holmes, M.A., M.D. Camb. and Lond., County Medical Officer for Nottinghamshire.
MAKALUA.—On Dec. 31st, 1928, at Warrior-square, St. Leonards-on-Sea, Matthew M. Makalua, M.R.C.S., L.R.C.P.
STARR.—On Christmas Day, at Toronto, Dr. Clarence Leslie Starr, Professor of Surgery at the University of Toronto.
TURNER.—On Christmas Day, 1928, after long suffering from his pioneer X ray work, Dawson Fyers Duckworth Turner, M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE FRENCH MEDICAL SERVICES IN THE WAR.

GENERAL MIGNON'S STORY.

Inspector-General A. Mignon, D.M.S. of the Third Army, was stationed in the Verdun area from the commencement of the war to November, 1918, when he was retired just before the Armistice on account of age. A practised author, with several books to his credit, he had been the Director of the Army Medical School at Val-de-Grâce when war broke out, and has lately been given facilities for reading original documents. He is thus well qualified to give an account of the development and service of the French medical corps throughout the war.[1] His work is arranged in four well-printed volumes, the first describing the period of education, the second, Verdun, the third, 1917 and 1918, while the fourth embodies reflections and deductions from a survey of the whole period. Military surgeons must in times of peace imagine what they will have to do in war. In the past manœuvres instructed only junior officers, the schemes of seniors were not criticised, and the staff appeared to think that removal of wounded from the battlefield was all that was required from the medical service. In the war the lack of coöperation between the medical and the General Staff was at first a serious impediment. Administrative difficulties were great: if small-pox broke out, 20 telegrams must be sent before one man was vaccinated. Antityphoid inoculation had been ordered to begin in October, 1914 (the vaccine, an autolysate, gave more reaction than the English), and General Mignon could not get any when he applied for it in August, 1914. The generals all wanted the wounded made comfortable, but administration was with the Chief of Staff; the Staff moved the medical units and the D.M.S. could neither detail his staff, nor get news of any intended operations. At first all wounded were sent down: blankets, food, medical instruments were lacking. In 1914 a mobile operating room, sent up by the Duchesse d'Uzès and Prince Platoff, did splendid work but was unapproved, and it was not until 1915, when the surgeons of Paris sent up another, that these mobile units became generalised. At first the trains for wounded were ill-equipped, slow, and gave no food, and there was but one section of motor ambulances. When the author had many casualties and few hospital beds, he asked to be given barracks, and got them, it being less hurtful to a sound man than to a sick one to sleep in a tent. The needs of the medical service had not been visualised; no one had stood up for the medical officer, or rather for the wounded and sick whom he protects. In treating wounds at first too much iodine was used, then came ether, and Abadie, of Oran, got striking success with 7 per cent. NaCl, but all antiseptics tried gave poor results. Then came Dakin's solution, and with the excision of wounds, Carrel-Dakin's method worked wonders. As to hygiene, in October, 1914, typhoid (335 cases) was recognised at Verdun. In 17 months the Third Army had 39,712 cases with 3384 deaths; the numbers for the same period in the B.E.F. are quoted as 2796 with 178 deaths (p. 535). The French soldier is not a drinker of hot water, like the Englishman, but chlorination of water stopped typhoid. Company officers took the greatest trouble in looking after their men, getting them dining-rooms to keep flies out of sleeping places, finding better clothes for them and steel hats; baths were set up in 1915, a laundry in 1916.

Verdun.

Mignon, when D.M.S. of the Third Army, was on Feb. 1st, 1916, put in medical charge of the adjacent but distinct Fortress of Verdun. On Feb. 9th he received information that the Germans would attack on the 15th. The hospitals were cleared in 48 hours, medical and venereal cases sent away, and stores were obtained. Mignon planned to link forward and rear units so as to get quick evacuation for wounded, and tried to collect surgical units. The Third Army sent him orderlies, stretcher-bearers came from Paris, and with their help a hospital of 350 beds was built at Baleycourt, and others were rearranged, restaffed, re-equipped. On Feb. 15th came a fierce storm of snow and bitter cold, so some extra time was gained; but it cleared suddenly on Feb. 20th, and on the next day the shelling began. Aid posts, field ambulances were swept away. One division lost 21 doctors; hospitals came under fire, and Baleycourt had to close on Feb. 28th. Throughout the next four months the routes of evacuation and the positions of hospitals were

[1] Le Service de Santé pendant la Guerre, 1914–18. By Médecin Inspecteur-Général A. Mignon. Paris: Masson et Cie. In four volumes. Vol. I., pp. 697, 1926; Vol. II., pp. 690, 1926; Vol. III., pp. 703, 1926; Vol. IV., pp. 831, 1927. Fr.240.

constantly changing. The first thing to provide in a new place was a surgical unit, with beds around it, then an examining post outside the hospital to feed and dress walking wounded, sent on by returning supply lorries. Later hospital huts were put closer together to save fatigue to the staff. Connecting wooden paths proved dangerous, for they burned one hospital in an air raid. General Mignon emphasises the importance of having subsidiary hospitals into which to relieve evacuation hospitals when these are likely to be submerged in a sudden flood of casualties.

The Somme and After.

The third volume deals with the Somme in 1916, the battles of 1917, the German attacks of 1918, and the victorious advance of 96 days before the Armistice. Preparing for the Somme, medical officers were directed to keep the walking wounded in the army areas, to take out of the areas the seriously damaged, and to make comfortable arrangements for the others. Large hospitals were placed 10 miles behind the lines, but they had not enough surgeons, so Amiens had to take the overflow. Before the battle of the Aisne (April, 1917) Parliament had disestablished the Director-General of the Armies, who was in fact replaced by a captain of the General Staff. General Nivelle had no medical officer on his staff either, and the new M.O.'s of the armies concerned were not told the idea nor the zero. The hospital scheme, devised in Paris, was too ambitious and not completed in time. Weather turned against the force, and the senior medical officer of the flank army had hastily to hospitalise 2652 lighter cases in a village. The attack failed, and the medical units were swamped. One of 1300 beds had 6000 cases to deal with. Visiting members of Parliament were shocked, and the medical service was blamed, but as our author, with scientific detachment, observes, the War Office should take the blame for the failure of its own scheme, or alternatively the General who underestimated his probable losses and engaged before the medical arrangements were completed. Later the medical officers got better information and their organisation was improved. In the 1917 offensives in Flanders the plans of the Paris Society of Surgeons were accepted; walking wounded were early separated, the best surgeons of Paris, at the front, cleaned the wounds at once, and patients were sent to the rear for suture, with excellent results, partly because only half the expected wounded appeared. In the German offensive of March, 1918, when the front was bent, chaos reigned. It is little use sending up a division in relief without its medical units, and these can do nothing without equipment. The month before July, 1918, when the 96 days of final advance began, the armies had been told to prepare to advance, and hospitals to divest themselves of extra stores. Gas was now a great trouble; the faster the Germans retired the more gas they sent over. A service for gassed men was set up parallel to that for wounded. In October cold became a difficulty, but especially influenza (36,304 cases that month); other diseases seemed to hold up in its presence. Barges made good means of evacuation. The hospitals of evacuation had by now many special divisions, eyes, face, and so forth. Divisional and forward units only prepared cases for evacuation; surgery was done by corps units or behind. This proved to be the best system.

Reflections and Deductions.

In his fourth volume, of reflections and deductions, Inspector-General Mignon expresses the view that the great cause of the success of the medical service in the war was the assimilation of the civil medical profession into the army. Military medical officers remained in touch with the command, and provided for the civil profession the means for doing their work, which was the care of the sick and wounded. Surgery was no longer thought a general service duty, but was restricted to specialists, and similarly other branches of medicine. The military medical service had itself undergone evolution. At the close there was a medical officer on the staff of every general; the medical officers knew how many casualties to expect, and when and where; they moved their units and sent the sick to whatever place they considered most conducive to a speedy recovery. They have not even yet got full command in their hospitals, nor the complete autonomy of a corps. Originally governed by a director on the "7th Direction" of the General Staff, after a year of war the "Service de Santé" was put under an Under Secretary for War. An Under Secretary of State is less hampered than a soldier by precedent, or by finance, and he has a numerous staff to help him; through his agency came consulting surgeons and physicians, inter-Allied surgical conferences, increased autonomy, and more reasonable relations with the command. When he relieved Nivelle Pétain felt that the Service de Santé was insufficiently represented at Headquarters, and added an inspector there to advise on coördination. Thus, thanks to many motor vehicles and to better relations with the railways, the war ended more comfortably for the wounded than it began; at least 80 per cent. of them were made fit to return to the line. The author's final conclusion as to the best method of procedure appears to be that divisional and forward units should collect the wounded, do first-aid, fill up the field cards correctly if possible, and deliver the patients to Corps, at the head of the car line, where the consulting surgeon will examine them, send the walking wounded in lorries some 100 miles back, retain untransportable cases (on whom he himself may operate, if he has time), and send the others to the hospitals of evacuation, special or general, 12 or more miles to the rear. Thus will the front be cleared to the best advantage, and thus also will the patients recover best. Inspector-General Mignon hopes there will never be another war, but fears that as usual, people will forget the horrors, and that increasingly as time goes on, only the self-sacrifice and nobility of the soldiers will be recalled. Therefore it is essential to remember the steps which eventually led to the building up of a fine Service de Santé.

THYROID METABOLISM, IODINE, AND VITAMINS.

THE remarkable effect of iodine in exophthalmic goitre is now well known, though it is not yet understood how it is brought about. In almost every case iodine causes an immediate slowing of the pulse-rate, lessening of the nervous symptoms and exophthalmos, and a fall of basal metabolic rate (B.M.R.) often to normal. These effects are not permanent, and usually there is a relapse after a few weeks, even though iodine is continued. The relationship of hyperthyroidism induced by thyroid feeding to exophthalmic goitre is not clear, but it is recognised that the latter is a more complicated condition than can be induced by mere excess of thyroxin. In this connexion the observations of D. A. Carson and William Dock [1] on the action of iodine on hyperthyroidism produced in man by thyroid feeding are of interest. They point out that the evidence on this subject from animal experiments is contradictory and they have been fortunate in being able to observe the effect of iodine on artificial hyperthyroidism in four male patients. Hyperthyroidism of the type commonly seen in human beings was first caused by thyroid feeding in four adult males, an increased basal metabolic rate of between 20 and 30 per cent. being obtained in each case. Lugol's iodine was then given and the effect on the clinical condition and B.M.R. was observed. In Case 1 the giving of iodine coincided with a reduction in dosage of thyroid, so the experiment was vitiated; in Case 2 iodine was given for three days only, but no effect could be observed; in Cases 3 and 4 six days' iodine therapy had no effect whatever on clinical signs or B.M.R. Carson and Dock think that this negative effect in patients with a healthy thyroid gland suggests that in pathological hyperthyroidism the gland itself is the site of the action of iodine. They also regard these results as further evidence against the theory of a qualitatively perverted secretion. It might, however, be argued that they are in accord with Plummer's theory that the symptoms of exophthalmic goitre are due in part to the secretion by the thyroid gland of an iodine-deficient catalyst and are therefore partially relieved by iodine, whereas those of simple over-secretion of the gland are not affected by iodine.

The relation of vitamins to iodine metabolism is another aspect of the subject that has been under consideration. D. Harvey,[2] of the Rowett Research Institute, has observed that if cod-liver oil (which contains iodine) is given to goats it causes more iodine to pass into the milk than is obtained when the goat is fed on equivalent amounts of potassium iodide and olive oil. From this it was deduced that some effect on iodine metabolism might be got from specific constituents of cod-liver oil, and good results have been reported in cases of Graves's disease with a preparation (vitiodum) which consists of iodised jecoleic acid incorporated with a vitamin concentrate from the oil. Some results of this treatment are reported by G. L. Adamson and A. T. Cameron,[3] of the University of Manitoba. These observers studied the effect of the combination in 12 cases of exophthalmic goitre, and found that it is as effective as Lugol's solution, and that its effects are equally limited. The same initial fall of basal metabolism was observed as with Lugol's solution, and this was accompanied by the same fall in pulse-rate and clinical improvement. With continued treatment there was usually a slight relapse, and withdrawal was followed by a rapid rise in the patient's B.M.R. and pulse-rate. For some cases the vitiodum was divided into two parts, one containing the iodised fatty acid only and the other the vitamins A and D only. In four cases these were given separately at first and later in combination. Two of these showed no definite lowering of the B.M.R. when the vitamin fraction was given alone, but one of these afterwards responded

[1] Amer. Jour. Med. Sci., 1928, clxxvi., 701.
[2] Biochem. Jour., 1927, xxi., 1268.
[3] Canad. Med. Ass. Jour., 1928, xix., 420.

satisfactorily to Lugol's solution, and the second to vitiodum. Two others which failed to respond to the iodised fatty acid fraction both gave a characteristic remission with vitiodum, While admitting that the number of cases is insufficient for definite conclusions, the authors suggest that the combination of iodised fatty acid and vitamins is necessary for a definite effect. Whether one or both vitamins are necessary, and whether the iodised fatty acid can be satisfactorily replaced by other iodine compounds has yet to be proved. They think that this may be an example of positive vitamin action which should be carefully studied because it is in contrast to their negative action in deficiency diseases. They apparently do not consider the small amount of iodine present in vitiodum enough by itself to produce the effect of the much larger amount of iodine in Lugol's solution. It is strongly emphasised that further work is necessary both to confirm the results and to investigate the possible relationship between vitamins A and D, the thyroid and iodine metabolism.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Jan. 8th.—5 P.M., THERAPEUTICS. An informal discussion on the Treatment of Established Diabetic Coma. The following have been invited to take part: Dr. E. P. Poulton, Dr. George Graham, Dr. R. D. Lawrence, Prof. MacLean, Dr. Otto Leyton, Prof. H. H. Dale, and Dr. P. J. Cammidge. 8.30 P.M., PSYCHIATRY. Discussion: Light Therapy in Mental Hospitals. Speakers: Dr. H. Dove Cormac, Dr. A. C. Hancock, Dr. G. de M. Rudolf, Sir Henry Gauvain, and Dr. R. Bourdillon. ELECTRO-THERAPEUTICS. Members of this section are cordially invited to attend the discussion.

THURSDAY.—5 P.M., BALNEOLOGY. Papers: Dr. David Brown and Dr. Woodmansey: The Excretion of the Constituent Ions of Sulphur Water in Fæces, Urine, and Sweat. Mr. Joseph Race: The Sedimentation Test. THERAPEUTICS AND PHARMACOLOGY. Members of this section are cordially invited to attend the meeting of Section of Balneology. 8 P.M., NEUROLOGY. Clinical meeting at National Hospital, Queen-square.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Papers: Mr. M. L. Hepburn: An Attempt to Classify (Pathologically) the Various Fundus Pictures in Diseases of the Choroid. Mr. M. S. Mayou: Juvenile Glaucoma.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY, Jan. 8th.—4 P.M. (in the Rooms of the Medical Society of London, 11, Chandos-street, W.), Miss C. Chisholm, M.D.: Alcohol and Drug Addiction in Rélation to Women and Children. Discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Jan. 7th, to SATURDAY, Jan. 12th.—WEST END HOSPITAL FOR NERVOUS DISEASES, Gloucester Gate, Regent's Park, N.W. Fri., at 8.30 P.M., demonstration on the Fundus Oculi by Mr. Lindsay Rea. Ophthalmoscopes required. Especially suitable for M.R.C.P. candidates. Further particulars from Secretary, Mayfair 2236.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Jan. 7th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Jan. 8th.—3.15 P.M., Mr. L. E. Barrington-Ward: Modern Methods in Treatment of Malignant Diseases.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Jan. 7th.—1.30 P.M.: Methods of Examination and Diagnosis Courses—Hearing Tests.

WEDNESDAY.—1.30 P.M.: The Sinuses.

FRIDAY.—4 P.M., Mr. H. Kisch: Nasal Obstruction.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

THURSDAY, Jan. 10th.—5 P.M., Dr. W. N. Goldsmith: General Eruptions in Children.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace-road, S.W.

TUESDAY, Jan. 8th.—5.30 P.M., Prof. A. Bostock Hill: Cleanliness: Is it the Basis of Health? Discussion.

LEEDS MEDICAL SCHOOL.

WEDNESDAY, Jan. 9th.—3.30 P.M., Prof. W. Blair Bell: Lead in the Treatment of Cancer.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE, Manchester.

FRIDAY, Jan. 11th.—4.30 P.M. (at the Whitworth-street West Branch), Dr. Fletcher Shaw: Delayed Labour.

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 1372.*)

THE following is the text of the official bulletins which have been issued during the past week and signed by Sir Stanley Hewett, Sir Hugh Rigby, and Lord Dawson of Penn:—

THURSDAY, DEC. 27TH, 1928. 8.20 P.M.

During to-day His Majesty's condition has not been so satisfactory. There has been disinclination to take nourishment, and the strength has been less well maintained.

FRIDAY, DEC. 28TH. 11.45 A.M.

The King had a fair night with quieter sleep towards morning. There is less difficulty with the taking of nourishment, and the general state has improved during the last 12 hours. At a consultation this morning the progress of the past week was reviewed. During that period there has been a definite improvement in the local condition. On the other hand, the general condition, as evidenced by weight and strength, does not show the same progress. Measures best adapted for meeting this difficulty were considered and determined. (Signed also by Sir Farquhar Buzzard and Sir Humphry Rolleston.)

8.15 P.M. The King has had a restful day. The slight improvement noted this morning is maintained.

SATURDAY, DEC. 29TH. 11.30 A.M.

The King has had a quiet night, and there is a very slight change for the better in His Majesty's condition.

8.15 P.M. The King has had a quiet day. The slow improvement noted this morning continues. No bulletin will be issued till to-morrow evening.

SUNDAY, DEC. 30TH. 8.30 P.M.

The King has had a quiet day. There is no change to report in His Majesty's condition.

MONDAY, DEC. 31ST. 11.55 A.M.

The King has passed a somewhat restless night. The general condition is maintained, although as previously noted the state of exhaustion still presents a difficult problem. There is a little more readiness to take nourishment, and the local condition is progressing. (Signed also by Sir Farquhar Buzzard and Sir Humphry Rolleston.)

8.30 P.M. The King has had a good day. There is no change in the conditions noted this morning. Bacteriological examination shows that the extent and potency of the local infection are diminishing. (Signed also by Dr. L. E. H. Whitby.)

TUESDAY, JAN. 1ST, 1929. 11.15 A.M.

The King has had a good night. The general and local conditions are unchanged.

8.15 P.M. The King has had a restful day and there is a slight improvement in the general condition. Administration of calcium, based on chemical examination of the blood, is producing beneficial results. (Signed also by Prof. Edward Charles Dodds.)

WEDNESDAY, JAN. 2ND. 11.15 A.M.

In spite of a restless night the condition of His Majesty remains unchanged from last evening.

8.15 P.M. The King has passed a good day and there is a slight improvement in his condition

INDEX TO "THE LANCET," VOL. II., 1928.

THE Index and Title-page to Vol. II., 1928, which was completed with the issue of Dec. 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

An Address

[ABRIDGED]

ON

PITFALLS IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS.

Delivered before the North-Western Tuberculosis Society

BY S. VERE PEARSON, M.D. CAMB., M.R.C.P. LOND.,

PHYSICIAN TO THE MUNDESLEY SANATORIUM.

A PITFALL is a trap to catch the unwary. To be wary is to be on the qui vive for dangers. A diagnosis is the recognition in the patient of a known disease from the symptoms which are characteristic of it. When pulmonary tuberculosis is to be defined it is necessary to recognise that, like many another disease, the condition is a process rather than a state, and that the treatment, as of all other diseased conditions, is the treatment of a patient and not of a disease. It is difficult always to realise this in these days of notification, when a patient has to be labelled with a disease by decree from a Government department. Pulmonary tuberculosis may be present yet it may be old and inactive. The important point to recognise is that the presence of the disease must be producing ill-health and must be diagnosed from the history and symptoms. As Dr. F. G. Chandler has said, "If the profession is going to continue to place reliance on physical signs and X rays as a means of diagnosis, countless tragedies will continue to happen."

The commonest symptoms indicating active pulmonary tuberculosis are cough, fever, pain, and lassitude. Dr. I. Struthers Stewart,[1] after examining 200 consecutive admissions to his sanatorium, set out the percentage occurrence of these symptoms as follows: cough 60, lassitude 48, pyrexia 42, hæmoptysis 27·8, loss of weight 12. But he omitted to note pain, which I have found in 70 per cent. It should, therefore, receive greater attention, and is often helpful in arriving at a diagnosis.

For example, a young married woman who was admitted to Mundesley Sanatorium a year or two ago had had repeated pains about the upper part of her left chest which had been labelled muscular rheumatism. The loss of weight she had experienced was ascribed to the vomiting of pregnancy and to mental worry. Many months after her confinement, because of a slight cough with a little expectoration, her chest was examined and X rayed, and this revealed fresh excavations at both apices.

E. E. Prest, investigating the history of hæmoptysis, pointed out some years ago that there was usually three years' delay between the initial hæmorrhage and the admittance to a special institution. If doctors were more regularly trained to ask for a specimen of sputum and to have it examined for *Bacillus tuberculosis* whenever suspicion of pulmonary tuberculosis was present, there would be fewer unwary ones and fewer unfortunates caught in a trap. Students and practitioners do not get sufficiently ample opportunities of seeing tuberculous cases which are relegated to the special dispensary and public institutions in the country. In Manchester, however, as also in Edinburgh and in one or two other places in England—though they are the exception—a tuberculosis expert who is also a servant under the public tuberculosis services is engaged to teach students. Manchester also has the advantage of an expert radiologist, well versed in chest work, as a teacher at the University.

If sputum is persistently negative for tubercle bacilli, especially if it is profuse, and the fingers are clubbed, bronchiectasis must be thought of. An intratracheal injection of lipiodol will clear up the diagnosis.

[1] See THE LANCET, 1925, i., 927.

Once in the last 25 years I have known a case of bronchiectasis in which tubercle bacilli were reported to have been found in the sputum on one occasion. Yet never, over the course of many years, did they recur, nor at any time did any signs or symptoms of tuberculosis appear in this patient. The slight unilateral bronchiectasis was rather difficult to demonstrate because it was on the left side and apt to be masked by the heart shadow. Yet when I established the correct diagnosis it made a great difference to the patient, a young man whose career was being damned by the label of pulmonary tuberculosis. His only symptom had been hæmoptysis; yet he had been condemned to a very restricted and guarded existence. He has now been leading a more or less normal life for some years.

PYREXIA.

Many do not know what constitutes fever, the best method of detecting it, or how to overcome the difficulties of getting careful observations. The best method is to take the temperature per rectum. This is easy in a sanatorium, but difficult for practitioners and tuberculosis officers. If the thermometer is placed in the mouth it should be kept there for at least ten minutes to get a reliable result. A rectal temperature above 98° F. A.M. and above 99·4° F. P.M. should be considered fever, at all events in a man. In most men, in fact, a rectal rest temperature of 98° F. A.M. and 99·4° F. P.M. will be found to be one degree higher than the average temperature of health. One degree lower are readings for oral temperatures. In women it is more difficult to lay down a hard-and-fast-line. In a paper published in 1909 [2] I gave illustrations of two women with evening temperatures a good many points above this level. The one was walking some miles daily; the other was confined to bed. The former married, had three children, and died a year or two ago of another cause than tuberculosis. The latter died within a couple of years of tuberculosis. Children are particularly difficult, as their temperatures are more easily upset. Furthermore, pulmonary tuberculosis and other forms of tuberculosis may upset their temperature for months or off-and-on for years, yet between 6 and 16 a majority of children have good resisting powers against tuberculosis. Sometimes tonsils and adenoids are at the root of ill-health which may simulate tuberculosis.

The other causes of fever without definite signs of physical disease which may constitute pitfalls are: (1) nerves; (2) microbic infections, such as endocarditis, lymphogranuloma, dysenteric liver or liver abscess, perinephric infection, bone infection, nasal sinus infection, typhoid, or paratyphoid; (3) malaria, rheumatic fever, coliform infection, or syphilis—these can often be eliminated by the administration of the proper drugs; (4) neoplasms. I am convinced that neurosis alone can sometimes keep a temperature up as much as 1° F.

FEAR OF TUBERCULOSIS AND PHYSIOLOGICAL LASSITUDE.

A trap into which the doctor is all too ready to fall in refusing to diagnose pulmonary tuberculosis is sometimes dug by the patient himself or his relatives. Amongst many there is a fearful obstinacy in admitting tuberculosis. This is largely a relic of the days when to make the diagnosis spelt the doom of the patient. It is also due to an erroneous idea of the infectivity. When patients, and doctors also, learn that early pulmonary tuberculosis is easily curable in a majority of cases, and that it is not infectious in the ordinary sense of the word, this obstinacy ought to disappear.

Another pitfall is due to the fact that lassitude is sometimes due to more or less physiological causes.

Some years ago I had a young professional woman sent to me with signs of slight fibrosis at one apex; her temperature showed a big swing—namely, from 97°–99·2° F. Besides being tired she was too thin. These symptoms might have been due to pulmonary tuberculosis, but I thought not. I discovered that her work necessitated her getting up early and that she had been going to bed rather late. One of the causes of her lapse from health was undoubtedly the

[2] See THE LANCET, 1909, ii., 852.

cumulative effect of too little sleep. Under an ordinary sanatorium régime she put on 6 pounds in weight and lost her lassitude without developing definite signs of tuberculosis. Now, four or five years later, I learn that she continues well.

The class of case in which lassitude is the main symptom and the other symptoms and signs are inconclusive constitutes a very difficult and most interesting one. These people, usually too thin, more commonly women than men, may have a little dry cough and doubtful temperature readings. They often have an obstinate anorexia, generally with a clean tongue. I have notes of a number of these cases and have followed up several over periods of many years. Very few of those where I have considered pulmonary tuberculosis absent have developed it later in life, but often they remain rather delicate for a year or two. They must be considered from three aspects (1) the presence of tuberculous lesions which, though healed, may break out again; (2) their general metabolism with special reference to the endocrine system; (3) their psychological make-up and condition.

Endocrine Disorders.

We know that the endocrine glands, associated with the sympathetic nervous system, are concerned with the activation of the body for defence. But we know also that an overacting sympathetic and thyroid, for example, can produce tachycardia, shivering, sweating, calcium loss, and increased metabolism. So if we have such overaction with lassitude and thinness suspicions of tuberculosis may be produced. Early Graves's disease is one of the traps to be avoided, especially since a raised temperature is common in this malady. Short of Graves's disease, however, abnormal endocrine interactions may be the cause of ill-health simulating early pulmonary tuberculosis. In the present imperfect state of our knowledge about endocrine imbalance it is not usually possible to set things right by administering appropriate glandular extracts, but this possibility must always be borne in mind.

I recall a difficult and doubtful patient, who took a year or two to get well. She was a young woman of 19 who received tuberculin injections with benefit about a year after she left the Mundesley Sanatorium. Now, in my belief, she never had pulmonary tuberculosis, though it was difficult to be sure, and I believe the tuberculin probably acted, as it may do in some other cases, by so-called protein shock stimulation of the thyroid adrenal apparatus. She was one of those who find it difficult to grow up and neither her intellectual not her psychical state was stable or satisfactory. To-day, years later, she is happily occupied and in good health.

When more is known about basal metabolic rates, when such observations are more frequently made on sanatorium and other classes of patients, when experience with the careful use of insulin in non-diabetic, but anorexic and thin, or obese and phlegmatic individuals has been gained, and when the use of pituitary and thyroid extracts is more scientific, then it will be not only easier to arrive at a diagnosis in some of these doubtful cases, but also easier to treat them satisfactorily. Again, the connexions between exposure to the sun, or other forms of light, and the adrenals and the pituitary are at present not fully understood. Langdon Brown[3] has said of normal people "we are now justified in saying that climatic environment can modify our psychic 'make-up' through the endocrine glands." Let us hope that still more in the future will it be possible to modify an invalid's mental and bodily condition and bring about health by an appropriate régime which will include, amongst other things, a regulation of the climatic environment, not only by the old-fashioned expensive method of change of air and travel but also by heliotherapy. But until more is known about endocrinology, until more clinical observations and experience have been gathered—e.g., on sun-bathing in England for patients with pulmonary tuberculosis—it is certainly best to proceed along the well-known régime, the common-sense lines of hygienic personal living which are often designated "sanatorium treatment." In most of these difficult cases that line of treatment produces satisfactory results, and it may be that even with enlarged knowledge the short cuts to health will be few, and the basis of successful treatment will probably remain as before.

[3] The Endocrines in General Practice, New York, 1927, p. 105.

Psychotherapy and Radiology.

With all these minor degrees of ill-health of doubtful ætiology it is particularly important to realise that the endocrine upset, or at all events the departure from health, is as likely as not psychical in origin. It may not be necessary with most patients to pry into the causes of an obvious mental discontent. But it is necessary to do this in a discreet and kindly manner in the type of patient now under review, or else the physician will not help much to a rapid recovery. Often an unhappy love affair or some other thwarting, perversion, or aberration of the sex instinct leads to an aimlessness in life which may be associated with many of the symptoms usually ascribed to pulmonary tuberculosis. Again, fear of phthisis or fear of loss of a pension, or the vested interest in being the happy recipient of the results of the diagnosis—perhaps erroneous—of pulmonary tuberculosis, may be the origin of the lapse from good health in body and mind. In many instances doctors have fallen into such traps.

Finally, there are many pitfalls in connexion with the diagnosis of pulmonary tuberculosis through over-reliance on and mistakes in the practice of that very helpful aid to diagnosis—radiology. These can mostly be grouped round the following three causes of mistake: (*a*) incomplete coöperation between physician and radiologist; (*b*) imperfect technique; (*c*) ignorance of what constitutes the normal. Of these, the last-mentioned cause of error is the commonest.

PERORAL ENDOSCOPY.

By V. E. NEGUS, M.S. Lond., F.R.C.S. Eng.,
JUNIOR SURGEON FOR DISEASES OF THE THROAT AND NOSE AT KING'S COLLEGE HOSPITAL.

THE following is a record of cases treated at King's College Hospital during four years.

Efficient œsophageal and bronchoscopic examinations and operative procedures entail frequent practice, not only by the surgeon, but also by his assistants. To determine whether the number and variety of cases make this possible and desirable is the object for which a record has been kept; the results show that in this hospital there is ample material for all purposes.

Table I.

—	Ap. 24, 1924, to Ap. 23, 1925.		Ap. 24, 1925, to Ap. 23, 1926.		Ap. 24, 1926, to Ap. 23, 1927.		Ap. 24, 1927, to Ap. 23, 1928.		Total, four years.	
	New.*	Exams.	New.	Exams.	New.	Exams.	New.	Exams.	New.	Exams.
Laryngoscopy	7	13	11	11	5	7	9	13	32	44
Pharyngoscopy	9	10	6	9	6	8	4	4	25	31
Bronchoscopy	4	5	11	34	14	106	14	54	43	199
Œsophagoscopy	42	46	46	55	44	59	44	71	176	231
Total	62	74	74	109	69	180	71	142	276	505

* New cases.

The number of patients for whom peroral endoscopic examinations have been required has remained remarkably constant during the four years beginning on April 24th, 1924, 1925, 1926, and 1927; the figures are 62, 74, 69, and 71 (Table I.). On the other hand, the number of examinations has increased considerably, mainly because of the greater number of bronchoscopies, rising from 5 in 1924 to 34, 106,

and 54 in the three succeeding years. A further cause of increase has been the greater number of œsophagoscopies carried out for treatment of various complaints, the figures being 46, 55, 59, and 71. The year ending April 25th, 1928, shows the smaller total of 142 examinations of all descriptions compared with 180 in the previous 12 months; a decrease in the bronchoscopic treatment of cases of lung suppuration was only partly compensated for by an increase in œsophageal procedures.

Training of Team.

Intelligent and enthusiastic coöperation by registrar, house surgeons, and nursing staff is a necessity; the assistant who controls the position of the patient and the sister or nurse who manages the instruments and swabs must carry out their duties with precision if the operator is to perform his work successfully. Even with a biannual change of senior house surgeon it is possible to maintain an efficient team once the general principles and attention to detail become part of the routine of the clinic. Every house surgeon is, in fact, himself able to pass a bronchoscope on the conscious patient before his term of office is completed. Our junior house surgeon works for six months in the out-patient department, and has opportunities of learning the principles of endoscopy.

Instruments.

At this hospital both Brunning's and Jackson's instruments are used; in almost all cases the latter were found preferable because of facility in sterilisation, lack of clumsiness, the absence of obstruction to the use of swabs, forceps, and other instruments, and the satisfactory arrangements for aspiration of secretions. We find that the lamps of Jackson's instruments are rather delicate, and require frequent attention. An efficient suction pump is a necessity; ours is incorporated in a special bronchoscopic table designed and executed by Mr. Johnston, chief engineer to the hospital (Fig. 1). To protect the eyes a shield has been devised. It consists of a disc of glass which can be rotated so that a clear area is always available.

Anæsthesia.

At King's College Hospital our technique is guided by the teaching of Chevalier Jackson;[1] the well-tested details advocated by him are followed with increasing strictness as time goes on. An example is the greater frequency with which local anæsthesia alone is employed. In our experience the increasing deftness which constant practice gives enables most endoscopic procedures to be carried out without general anæsthesia, to the satisfaction both of the surgeon, and—what is more important—of the patient. Of laryngoscopies, 17 were performed with local and 27 with general anæsthesia; for pharyngoscopies, the figures are 7 and 24; of œsophagoscopies, 111 were under local and 120 under general anæsthesia; and of bronchoscopies, 148 patients had local anæsthesia only, while for 51 a general anæsthetic was thought desirable (total 283 local and 222 general). Morphia, scopolamine, and atropine are given to most of the patients examined under local anæsthesia, but patients who have had two or three examinations usually prefer to have atropine only.

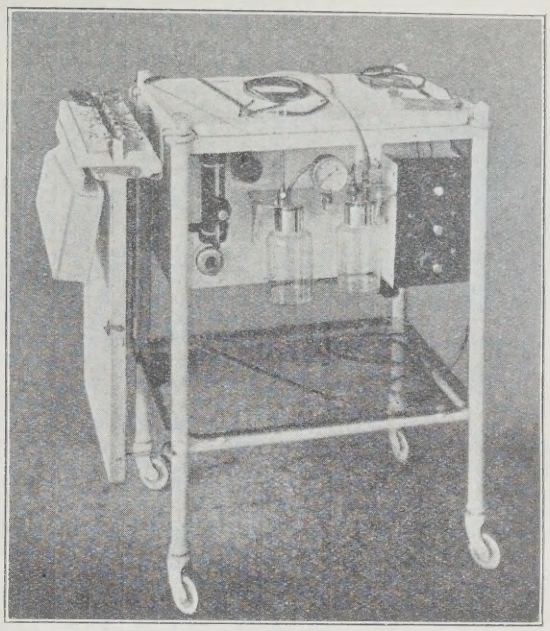
The proportion of those examined under local anæsthetic is increasing as compared with those requiring a general anæsthetic.

Position of Patient.

The Boyce position, as used by Chevalier Jackson, is much preferred in our clinic to the ordinary recumbent or to Mouret's position. The air and food passages can be brought into any desired position; the patient feels less strained; secretions do not overflow into the larynx to cause choking; œsophageal respiration is less; and the discomfort of operative manipulations is lessened. Under local anæsthesia the patient is not held down; he lies still and only needs to have his position maintained by steadying the shoulders. The table, stool, and foot-rest must be at the correct height, a measuring rod being provided to control the position on each occasion.

[1] See THE LANCET, 1926, i., 924.

FIG. 1.—TABLE FOR BRONCHOSCOPY.
(*King's College Hospital Pattern.*)



The frame of the table is a tubular metal construction, mounted on castors, and has a marble top and a lower shelf. The marble top forms the cover to a sound-proof metal case containing an oil-immersed rotary pump, belt-driven by an electric motor. Mounted on the front of the metal case are two suction nozzles, connected through two bottles with the pump—one bottle for collecting the blood and secretions, the second as an overflow vessel to safeguard against any liquids reaching the pump. On the left is a switch controlling the motor and a rheostat to regulate the speed, the resulting strength of the suction being shown on the vacuum gauge which is fixed between the two bottles. On the right are three circular rheostats to control the lights of the bronchoscopes or œsophagoscopes. The above switch and rheostats are all fitted with specially designed metal tops, easy of detachment for sterilising; they can therefore be handled by the operating surgeon. All these, as well as the bottles, gauge, suction nozzles, and terminals for the lamp connecting wires are protected by the overhanging marble top from accidental damage in moving the table from place to place.

On the top of the table are seen a bronchoscope and laryngoscope, together with suction tubing, which can be attached to the bronchoscope or œsophagoscope, or to an independent suction tube. On the left of the table is suspended a container for the light carriers. This is made in two halves, hinged together at the bottom to open in hook form for access to all parts of the interior for cleaning, &c., and is lined with rubber of such construction that the light carriers are held rigidly in position and are kept sterilised by formalin vapour supplied from tablets placed in the bottom of the container. The whole table is self-contained and freely movable from place to place.

The table has been designed by Mr. Negus and Mr. Johnston, chief engineer to King's College Hospital, and was made in the hospital's works department.

Laryngoscopy (see Table II.).

Removal of papillomata from children made up a considerable number of cases, and for them a general anæsthetic was thought desirable. The next most common cause of laryngoscopy was direct examination for carcinoma of the larynx, either to determine the exact extent of the disease or to take a piece of tissue for microscopy. The latter proceeding is carried out easily and without fear of damage to healthy tissues when Jackson's biopsy biting forceps are used.

Pharyngoscopy (see Table III.).

Diagnosis and treatment of carcinomata made up the greater number; diathermy was used in several

cases through a laryngoscope, and in other cases seeds of radium emanation were inserted.

TABLE II.—*Laryngoscopy.*

—	Ap. 24, 1924, to Ap. 23, 1925.		Ap. 24, 1925, to Ap. 23, 1926.		Ap. 24, 1926, to Ap. 23, 1927.		Ap. 24, 1927, to Ap. 23, 1928.		Total, four years.	
	New.*	Exams.	New.	Exams.	New.	Exams.	New.	Exams.	New.	Exams.
F.B. needle	1	1	—	—	—	—	—	—	1	1
Granuloma	2	2	—	—	2	2	1	1	5	5
Singer's nodes	—	—	1	1	—	—	—	—	1	1
Cyst of epiglottis	—	—	1	1	—	—	—	—	1	1
Laryngeal cyst	—	—	—	—	1	1	1	1	2	2
Papillomata	3	9	5	5	1	2	—	—	9	16
Laryngeal stenosis	—	—	—	—	—	—	1	3	1	3
Carcinoma	1	1	4	4	1	2	6	8	12	15
Total laryngoscopy	7	13	11	11	5	7	9	13	32	44

* New cases.

TABLE III.—*Pharyngoscopy.*

—	Ap. 24, 1924, to Ap. 23, 1925.		Ap. 24, 1925, to Ap. 23, 1926.		Ap. 24, 1926, to Ap. 23, 1927.		Ap. 24, 1927, to Ap. 23, 1928.		Total, four years.	
	New.*	Exams.	New.	Exams.	New.	Exams.	New.	Exams.	New.	Exams.
F.B. pin	—	—	—	—	—	—	1	1	1	1
Fish bone	2	2	—	—	—	—	1	1	3	3
Granuloma	1	1	—	—	1	1	—	—	2	2
Fibroma	—	—	1	3	1	3	—	—	2	6
Carcinoma	3	3	2	2	4	4	2	2	11	11
Diathermy	3	4	1	1	—	—	—	—	4	5
Insertion of radium seeds	—	—	2	3	—	—	—	—	2	3
Total pharyngoscopy	9	10	6	9	6	8	4	4	25	31

* New cases.

Bronchoscopy.

Table IV. shows clearly that experience derived solely from foreign body work will be very limited and quite inadequate to qualify the operator or his team; in the four years five bronchoscopic examinations were made for foreign bodies and 194 for other reasons.

A large shawl pin, a metal clip, and a wood screw were removed without difficulty; the screw was unsuspected and had led to a tentative diagnosis of whooping-cough (Fig. 2). A small black-headed pin offered a difficult problem, as it was lodged in an anterior ventral branch of the right lower lobe bronchus, of a calibre far too small to allow of the introduction of any bronchoscope. A preliminary direct examination made to confirm this supposition is tabulated as "unsuccessful bronchoscopy for F.B." After sufficient practice on an excised pair of lungs under the fluorescent screen in the X ray room the patient was held in such a position that the forceps, when introduced through a bronchoscope into the mouth of the branch known to contain the pin, entered in the axis of the small bronchus; the pin was grasped under guidance of the screen and was removed. A foreign body not included in the list was a swab which became detached during the bronchoscopic treatment of a patient with multiple cavities in the left lung; it was recovered two days later with some difficulty. This bronchoscopy is purposely excluded from the tables as it was a self-made and preventable job.

Since the date on which this report terminated the number of bronchial foreign bodies has increased. An orange-pip has been removed from a child of 4 without any anæsthetic except morphia gr. 1/10th; the pip had been in situ for over a month. Removal of a molar tooth impacted for one month in the left lower lobe bronchus of a child of 7 took a long time and was particularly difficult; general anæsthesia was used. A third child was admitted with a pin in the mouth of the right upper lobe bronchus, but cured itself by coughing out the foreign body. A fourth object is illustrated (Fig. 3).

TABLE IV.—*Bronchoscopy.*

—	Ap. 24, 1924, to Ap. 23, 1925.		Ap. 24, 1925, to Ap. 23, 1926.		Ap. 24, 1926, to Ap. 23, 1927.		Ap. 24, 1927, to Ap. 23, 1928.		Total, four years.	
	New.*	Exams.	New.	Exams.	New.	Exams.	New.	Exams.	New.	Exams.
F.B.: Pin	1	1	—	—	1	1	—	—	2	2
Metal clip	—	—	—	—	1	1	—	—	1	1
Wood screw	—	—	—	—	—	—	1	1	1	1
Unsuccessful for F.B.	—	—	—	—	1	1	—	—	1	1
Granuloma of larynx	1	2	—	—	—	—	—	—	1	2
Irritation by tracheal cannula	1	1	—	—	—	—	1	2	2	3
Fibroma of bronchus	—	—	—	—	1	3	—	—	1	3
Spasm of bronchial muscles	—	—	—	—	—	—	1	1	1	1
Pressure from without	—	—	—	—	—	—	3	3	3	3
Negative for cause of hæmoptysis	—	—	—	—	1	1	—	—	1	1
Dyspnœa due to œsoph. carc.	—	—	—	—	—	—	1	1	1	1
Lung suppuration; unsuccessful attempt	—	—	1	1	—	—	—	—	1	1
Diffuse lung suppuration	—	—	1	4	2	3	—	—	3	7
Aspiration: lung abscess	—	—	1	1	—	—	2	3	3	4
Aspiration: bronchiectatic cavities	—	—	5	21	7	96	5	43	17	160
Irrigation bronchiectatic cavities	1	1	3	7	—	—	—	—	4	8
Total bronchoscopy	4	5	11	34	14	106	14	54	43	199
Total bronchoscopy for F.B.	1	1	—	—	3	3	1	1	5	5
Total bronchoscopy for other causes	3	4	11	34	11	103	13	53	38	194
F.B.'s removed from bronchus	—	1	—	—	—	2	—	1	—	4
F.B.'s removed from œsophagus	—	15	—	11	—	9	—	11	—	46

* New cases.

A highly satisfactory case was that of a lady who was in a sanatorium because of recurrent hæmoptyses; the cause was a fibroma obstructing the left lower lobe bronchus. The case has already been reported by Dr. L. S. T. Burrell and Dr. R. R. Trail, who referred her to me through the kind agency of Sir StClair Thomson. A preliminary bronchoscopy showed a smooth, rounded neoplasm from which a piece was taken for microscopy. After microscopical diagnosis a second bronchoscopy was performed, and the tumour was nibbled away with long cup forceps through a 7 mm. Jackson's aspirating bronchoscope. This tube was preferred to a larger bronchoscope because of its mobility and its arrangement for continuous suction. At a third examination no remains of the fibroma were seen, and up till now there has been no sign of recurrence.

In three or four cases bronchoscopy was performed to confirm or contradict a clinical diagnosis of carcinoma of the lungs, and in each case direct examination gave a correct report.

A patient with œsophageal carcinoma—treated many times with radium—suffered from attacks of dyspnœa, which suggested ulceration into the trachea, but at bronchoscopy no opening was seen; post-mortem examination showed a fairly extensive involvement of the trachea with s

hole about 1 inch long. Either the rupture took place after bronchoscopy or else the opening was present and was not seen; the latter alternative, although discouraging, is, I fear, correct.

A case first thought to be one of spasm of bronchial musculature was examined again and proved to be due to pressure on the trachea by an aneurysm of the aorta and innominate artery; two other cases of pressure from without were examined, both apparently caused by mediastinal new growths.

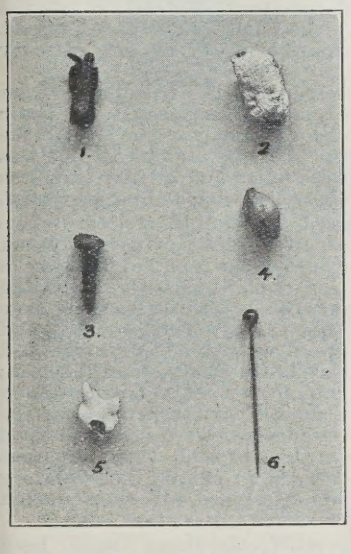
On one occasion the bronchoscope could not be passed owing to the rigidity of the patient; two or three days later and on several subsequent occasions a successful introduction was made under local anæsthetic. Although a general anæsthetic has to be used in certain cases, yet it is far better to dispense with it whenever possible.

Of cases of diffuse suppuration one appeared to have multiple small bronchiectases and was not improved; two others had diffuse bronchitis and were referred for medical treatment.

Of three patients with lung abscess all were cured with ease, thus demonstrating in a limited number of cases that greater success will be achieved when bronchoscopic treatment is commenced early.

One woman who for three weeks had suffered from fever of hectic type following dental extractions was cured after two aspirations combined with local medication, no doubt because of the removal of infected clot associated with efficient drainage and the reduction of granulation tissue: the abscess was in the right upper lobe. A second woman had only one aspiration; she afterwards improved rapidly and left hospital well. High temperature and expectoration of foul pus followed tooth extraction, and her cure was apparently due to the bronchoscopic removal of septic clot. The third patient was a man on whom total laryngectomy was performed; he had considerably raised respiratory rate and high fever commencing on the second day after operation. He was coughing up copious fœtid pus, with signs suggestive of cavitations in the left lower lobe with gangrene of the lung. Through an aspirating bronchoscope stagnant secretions were removed, with almost immediate recovery and the disappearance of the previous physical signs.

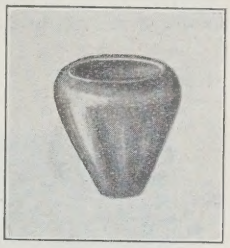
FIG. 2.



Foreign bodies removed from bronchi: (1) Metal clip from a toy; mouth of left upper lobe bronchus of boy aged 7 years. (2) Gauze swab; left lower lobe bronchus of a man. (3) Wood screw; top of left lower lobe bronchus of boy aged 4 years. (4) Orange pip; entrance of left lower lobe bronchus of girl aged 4 years. (5) Molar tooth; left lower lobe bronchus of girl aged 7½ years. (6) Black-headed pin; right anterior distal branch of right lower lobe bronchus of woman aged 24.

Cases of bronchiectatic cavity are grouped together whether originating as primary dilatations of one or more bronchi or as the result of bursting of a lung abscess into a bronchus with secondary expansion of the latter. In either case the rationale of bronchoscopic drainage depends on aspiration of stagnant pus, on dilatation of obstructed bronchi, and on reduction of granulation tissue by local applications of 10 per cent silver nitrate. Lavage was tried on a few occasions but appeared to do more harm than good, and instillation of antiseptics seemed to have the same unsatisfactory result. Unfortunately, in not one of the 19 patients with pus-containing cavities was a foreign body found, although constant search was made. All the patients, in addition to bronchoscopic aspiration and local medication, were made to use a Burney Yeo inhaler, to take creosote, and to employ postural coughing. The group comprises 19 patients on whom a total of 168 bronchoscopies was performed; the least number of treatments for any one patient was 1, and the greatest number was 35. Three patients died during treatment—one of mediastinitis as the result of puncture through the cricothyroid membrane for the injection of lipiodol; one, after temporary improvement, from gangrene of the lung connected with extensive cavities; the third from extensive bronchiectatic cavities in the left lower lobe associated with pleurisy and probably empyema. Four patients were temporarily improved by bronchoscopy, but subsequently relapsed. One, who at first showed no signs of tuberculosis had a large infected cavity in the left upper lobe and was very much better after four aspirations, with normal temperature, diminution of sputum, and gain in weight. Three months after leaving hospital he returned with signs of active pulmonary tuberculosis and died soon afterwards. The case was regarded first of all as one of simple bronchiectatic abscess; bronchoscopy is never performed on patients who are known to have phthisis.

FIG. 3.



Metal cap from de Vilbiss spray; removed from right main bronchus of a man (actual size).

Another patient had a big multilocular cavity in the right upper lobe; he was very much improved by weekly aspiration, for which—like most of our other patients— he came up from his home in the morning, returning in the afternoon. He was kept quite comfortable by 30 bronchoscopic treatments over eight months, but then found he could not himself empty his cavity by postural coughing. Artificial pneumothorax was tried, but without success and thoracoplasty was performed, unfortunately followed by death.

Two other patients improved temporarily but relapsed, and bronchoscopy was discontinued. Three cases were unimproved, two being children for whom general anæsthesia was thought necessary; its use no doubt discounted any benefit derived from bronchoscopy. Four patients were slightly improved; one preferred to leave hospital although she might have been wiser to continue treatment; for the others continuance of aspiration did not seem to be indicated. One patient with extensive cavities in the right upper lobe was very materially improved by aspiration and local swabbing with silver nitrate, but finally thoracoplasty was required because of persistent fœtor uncured by bronchoscopy or by the local use of iodoform or gomenol. Three patients have been very much improved. One had fairly extensive bronchiectatic cavitations in the left lower lobe; he had eight aspirations, the last in June, 1926, and has not required any more since. Two other patients have multiple cavities and have kept well enough without further aspiration, one having had 24 treatments and the other 7.

Conclusions regarding Bronchoscopy.

For success in removal of foreign bodies from the bronchi frequent practice in bronchoscopy is required, and can only be obtained by the treatment of cases of lung suppuration, combined with practice on dissected lungs, rubber tubes, and anæsthetised animals.

A definite diagnosis of the presence or absence of a neoplasm of the lung can almost always be made by bronchoscopy. A simple new growth can be removed, even from a secondary bronchus.

Lung abscesses, if early, can be cured by bronchoscopy. Bronchoscopic aspiration of pus-containing cavities in the lungs should be tried in all cases which do not respond to ordinary medical treatment; the use of drugs and postural drainage should always be combined.

Bronchoscopy alone should not be continued if unsuccessful; the patient should be referred for thoracoplasty or other external operation.

Of the series of cases of bronchiectatic cavities recorded 52·6 per cent. were failures, 26·3 per cent. were relieved, and 21·0 per cent. were successes.

TABLE V.—*Œsophagoscopy.*

—	Ap. 24, 1924, to Ap. 23, 1925.		Ap. 24, 1925, to Ap. 23, 1926.		Ap. 24, 1926, to Ap. 23, 1927.		Ap. 24, 1927, to Ap. 23, 1928.		Total, four years.	
	New.*	Exams.	New.	Exams.	New.	Exams.	New.	Exams.	New.	Exams.
F.B.: Negative	5	5	7	10	4	4	7	7	23	26
Unsuccessful	3	3	3	3	1	1	2	2	9	9
Fish bone	3	3	—	—	1	1	2	2	6	6
Meat bone	2	2	2	2	—	—	4	4	8	8
Meat bolus	—	—	1	1	—	—	—	—	1	1
Poultry bone	—	—	2	2	—	—	1	1	3	3
Denture	—	—	2	2	1	1	—	—	3	3
Coin	9	9	3	3	6	6	3	3	21	21
Metal washer	—	—	1	1	—	—	—	—	1	1
Bone button	—	—	—	—	—	—	1	1	1	1
Metal whistle	—	—	—	—	1	1	—	—	1	1
Safety-pin	1	1	—	—	—	—	—	—	1	1
Neg. œs. after F.B.	1	1	—	1	—	—	—	—	1	2
Dysphagia:										
Painful contraction of crico-pharyngeus	—	—	1	1	—	1	—	—	1	2
Leaking fistula	—	—	—	—	—	—	2	2	2	2
Unsuccessful attempt at œs.	—	—	—	—	1	1	1	1	2	2
Neg. for dysphagia	6	7	—	—	6	6	6	6	18	19
Diaphragmatic hiatal stenosis	1	1	—	—	1	1	1	6	3	8
Simple stricture	1	1	1	1	3	12	3	10	8	24
Carcinoma: High	3	3	4	4	3	3	1	1	11	11
Middle	1	1	7	7	7	12	5	15	20	35
Low	2	2	3	3	4	4	2	5	11	14
Insertion of radium	3	6	7	11	2	2	—	—	12	19
Insertion of Souttar tube	1	1	1	2	2	2	1	2	5	7
Removal of Souttar tube	—	—	—	—	—	—	—	1	—	1
Pressure from without	—	—	1	1	—	—	1	1	2	2
Neg. for primary focus; glands in neck	—	—	—	—	1	1	1	1	2	2
Total œs.	42	46	46	55	44	59	44	71	176	231
Total œs. for F.B.	24	24	21	25	14	14	20	20	79	83
Total œs. for other causes	18	22	25	30	29	45	25	51	97	148

* New cases. Œs. = œsophagoscopy.

As shown in Table V., 231 examinations have been made, 83 in foreign body cases and 148 for other reasons. In 23 patients a foreign body was suspected, but was not found; in a few it may have slipped down in front of the tube. In nine patients an unsuccessful attempt was made at removal; in four of these the object was recovered at a subsequent attempt. The reason for lack of success was: in three cases the use of Mouret's sitting position and the obscuring effect of much frothy saliva; in one intense trauma as the result of previous œsophagoscopy in another hospital; in one slipping of the object after discovery; in one the use of unsuitable forceps; in one transparency and small size of the foreign body; and in one lack of skill in grasping a coin. Seventeen bones were removed; six were fish bones, eight were from meat, and three from poultry (Fig. 4). Disimpaction of an embedded point was in many cases difficult, particularly when attempted upon the sitting patient, in whom the large amount of frothy saliva and mucus, so commonly seen, caused most unpleasant choking. An observation often made may be repeated here—namely, that if a patient is convinced that a bone is stuck in the throat the chances are strongly in favour of the correctness of the statement.

All the foreign body cases—including those in the bronchi—were successful and in none did untoward symptoms occur—that is to say, all the patients went home with the cause of their trouble brought to the surface or with an assurance that no extraneous object was present in the air passages, pharynx, or œsophagus. Coins were frequent, almost always at the level of the crico-pharyngeal fold of young children. As a rule, it may be said that an anæsthetic causes a child a great deal more fear and discomfort than does the removal of the foreign body, which can be effected in a few seconds if the operator and his assistants are well practised. Twenty-one in all were removed. In two instances the coin had been in situ for three months and the extensive granulations made localisation difficult; in neither case was there any subsequent cicatricial stricture (tabulated as "negative œsophagoscopy after F.B."). Only one safety-pin has been encountered and that with the point down, so that no difficulty was met with; the ring was grasped by rotation forceps and the pin was removed with the point trailing. No difficulty was experienced with other foreign bodies.

Of patients complaining of dysphagia not caused by foreign body 18 were found on examination to be without any organic lesion. On two occasions the œsophagoscope could not be passed because of the rigidity of the patient under local anæsthesia; in each case a general anæsthetic allowed an examination to be made.

A young female patient with pain in the crico-pharyngeal fold, relieved by swallowing, was cured by dilatation with a big œsophageal speculum; in view of the great force exerted by the muscle band in its normal state of contraction it is surprising that no more cases have presented themselves. Of cases of arrest of food at the level of the diaphragm one was treated by dilatation with Jackson's bougies and also with Brown Kelly's pattern of hydrostatic bag because of some inflammatory contraction at the diaphragmatic hiatus; these procedures were thought necessary before the routine use of Hurst's mercury bougie.

Of patients with pressure on the œsophagus from some external cause one was suspected of aortic aneurysm associated with carcinoma at the level of the crossing of the left bronchus. An œsophagoscope was passed as far as the aortic bulge and a Hill's tube was slipped through the stricture, with temporary relief.

In the group classed as simple stricture two patients had dysphagia after total laryngectomy and in both there was a rupture of the repaired pharynx in the site of the operation scar, apparently associated with cicatricial stenosis. Of six other cases there were histories of 20, 17, 15, and 13 years', nine months' and three weeks' duration; all were much improved and swallowing of solids was fairly easily re-established; in one or two cases Plummer's thread-guided method was used. Four cases showed strictures close to the crico-pharyngeal fold, while two were near the level of the left bronchus. One patient with apparent carcinoma was proved to be of simple inflammatory type by the examination of a piece of tissue removed with long forceps of Jackson's type.

Forty-six patients with carcinoma have been examined; although a correct diagnosis may often be made without the use of the œsophagoscope, it is in our opinion invariably necessary to make a direct examination. As already noted, one woman with all the clinical and X ray appearances of carcinoma was found by œsophagoscopy to have a simple inflammatory stricture; she was cured. Two other patients had the symptoms, clinical and X ray appearances of non-malignant obstruction at the level of the diaphragm, but both were proved to have carcinomata, as demonstrated in microscopical sections. A correct diagnosis is very necessary, as such forms of treatment as the mercury bougie are definitely contra-indicated in cases of malignant new growth. Of 46 cases, 11 were at or close to the crico-pharyngeal fold, 8 in men and 3 in women; 24 were at or near the middle of the œsophagus, 22 in men and 2 in women, 1 of whom was not definitely proved to have a carcinoma; 11 were at the level of the diaphragm, 9 in men and two in women. Of the total patients 39 were men and 7 were women. The ages of patients were as follows: of

growths at the top, the youngest man was 50, and the youngest woman 58; the eldest man was 84, and the eldest woman 70. Growths at the middle occurred at 48 in the youngest man, and at 63 in the youngest woman; at 77 in the eldest man, and at 73 in the eldest woman. Of growths at the bottom the youngest man was 44, and the youngest woman 46; the eldest man was 77, and the eldest woman 70.

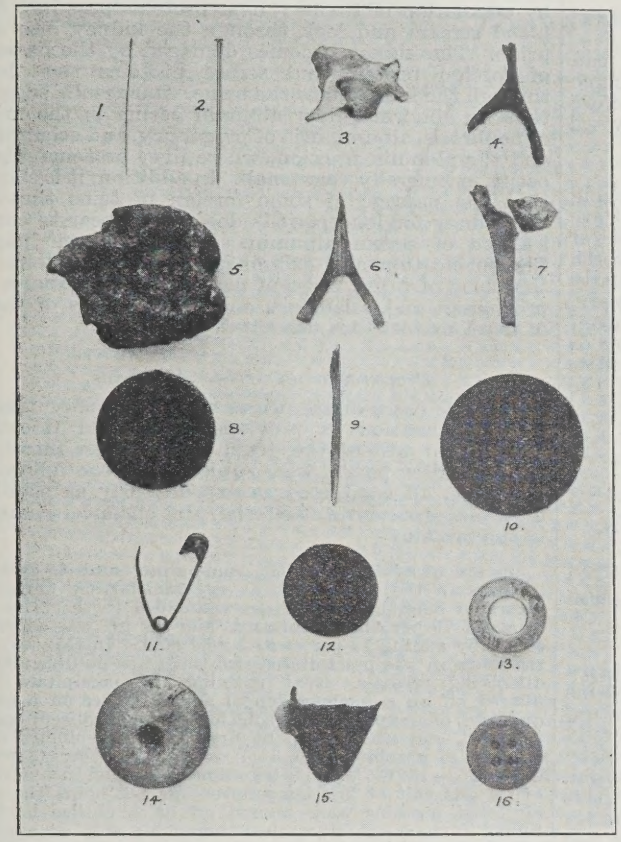
Of those growths at the top of the œsophagus none of the male cases appeared suitable for operation. Of the women two had typical post-cricoid neoplasms; one had total laryngectomy and pharyngectomy, but, owing to the wide extent of the growth with involvement of the thyroid gland, death took place next day. A second patient refused operation and the third appeared unsuitable. For this type of case either lateral pharyngectomy by Trotter's method or pharyngectomy combined with laryngectomy are advocated; failing these procedures the patient is referred for gastrostomy. For carcinomata near the middle of the œsophagus various measures have been employed, all palliative, but some of them enabling the patient to swallow fairly comfortably until he dies of asthenia or of lung complications, without the unpleasant necessity of gastrostomy feeding. Simple dilatation under vision with Jackson bougies has given considerable relief; Plummer's thread-guided method has also been used, but in some cases there has been difficulty in getting the thread to pass. One patient devised the method of piercing a carbolic lozenge and attaching the thread to it; after being swallowed, the lozenge partly dissolved until it was small enough to pass through the stricture. Souttar's tubes have been introduced seven times and often with relief; the difficulty has been to keep them in place. In two patients death took place one and three days respectively after introduction from general asthenia and not from perforation of the œsophageal wall.

Radium has been used on 12 patients, the least number of milligramme-hours being 800 and the most 3700, with figures in others of 2400, 1750, and 1600.

A method recently employed was to apply 100 mg. of metallic radium or a tube of radon in a silver container attached to a whalebone staff; below the container was screwed a large olivary bulbous end, perforated for a thread as in Plummer's method (Fig. 5). The bougie is guided by the thread through the malignant stricture, and is pulled up until its shoulder taps against the lower end of the stricture; the radium is then in correct position in the growth and is retained there for two or three hours. The procedure can be repeated daily without much discomfort. One patient had 22 applications; he died of extension of the growth above the level of the part irradiated, the trachea being involved. Alterations in the applicator have now been made to allow of better distribution of the radium.

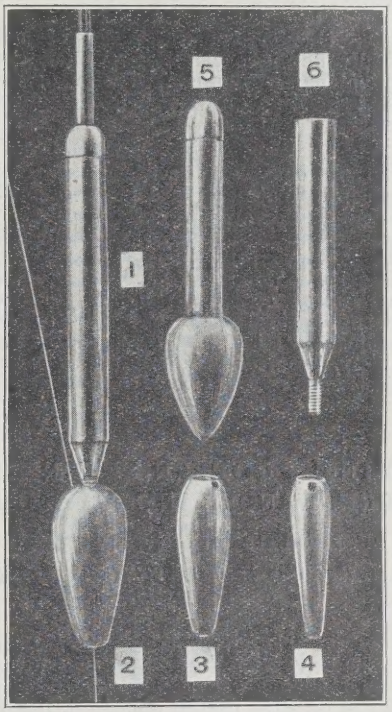
Growths at the lower end of the œsophagus were in one or two instances primary, but some spread up from the stomach; gastrostomy was the routine

FIG. 4.



Foreign bodies removed from larynx, pharynx, and œsophagus: (1) Needle impacted in larynx. (2) Pin from pyriform fossa; (3)–(16) from œsophagus: (3) Zygoma of rabbit. (4) Wishbone of chicken. (5) Beef bone. (6) Fish bone. (7) Clavicle of duck. (8) Halfpenny. (9) Fish bone. (10) Penny (boy aged 1 year 1 month). (11) Safety-pin (girl aged 2 years). (12) Farthing. (13) Metal washer. (14) Metal whistle. (15) Denture. (16) Button. (The penny (10) shows the scale of reduction.)

FIG. 5.



Radium applicator: (1) Radium container with whalebone staff above. (2) Olivary bougie, perforated for thread, attached to container. (3) and (4) Metal bougies for preliminary dilatation. (5) Container drilled out almost to top, to apply radium to lowest part of growth. (6) Extension to fit between (1) and (2) in order to apply radium to highest part of growth.

The natural length of the container (5) is 6 cm.; the other illustrations on the figure are reduced in proportion.

procedure, or jejunostomy if the stomach was extensively invaded. A piece of tissue can be taken without danger in suitable cases in order to establish a definite diagnosis. One patient appeared to have suffered from œsophagectasia, caused by a neurosis of the lower end of the œsophagus. Later he had an inflammatory stricture—no doubt as the result of stagnation of food—as seen with the œsophagoscope. It was only after some months that malignant changes were suspected and were confirmed by microscopy, thus emphasising the necessity of frequent direct inspection.

Conclusions.

All manner of foreign bodies can be retrieved by the route of which they entered—that is to say, by œsophagoscopy.

Simple strictures respond very well to treatment, but direct examination is required.

Even though the diagnosis of carcinoma can generally be made correctly without œsophagoscopic examination, yet mistakes can occur. Therefore direct inspection and a positive diagnosis are always necessary.

Summary.

The number and variety of cases requiring endoscopic treatment in a large general hospital are sufficient to warrant the purchase of an efficient set of instruments and to make constant practice worth while. Attention must be paid to detail, particularly in preparation for the removal of a foreign body. The removal of foreign bodies does not by itself give sufficient practice, either in œsophagoscopy or bronchoscopy; the best road to success is to follow minutely the rules laid down by a master of the subject, such as Dr. Chevalier Jackson.

URINE PROTEINS IN NEPHROSIS, PREGNANCY, AND MYELOMATOSIS.

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SEVERAL explanations of the origin of urinary proteins have been suggested. The idea that proteins of the food are excreted by the kidney, either unchanged or after partial digestion, has been generally abandoned, and it is now accepted that urinary albumin in nephrosis is identical with serum albumin. The interesting results of Hynd (1925) support this view, but he himself admits that he did not purify the proteins satisfactorily. The present author has shown (1927 [1]) that, for determination of the optical rotatory power of proteins, careful purification is necessary, and particularly the removal of lipins under conditions precluding denaturation. When efficient purification with suitable precautions is effected, concordant and characteristic values for the rotatory powers of proteins are obtained. Hynd obtained values ranging from $-49°$ to $-66°$ for the specific rotation of proteins from the urine of patients with chronic nephritis and albuminuria of pregnancy, and values of from $-34°$ to $-41°$ and from $-49°$ to $-59°$ in eclampsia. He concludes that serum albumin (rotation $= -52·9°$) is excreted in nephritis, albuminuria of pregnancy, and some cases of eclampsia, but that in other cases of eclampsia lactalbumin (rotation $= -41·2°$) is excreted in the urine owing to some derangement of milk secretion. No clinical differentiation was made between the two classes of eclampsia, which were apparently identical in symptoms. Owing to the small quantities available, Hynd did not free the proteins from lipoids, which seriously affect the rotation, and they may have been contaminated with nitrogenous substances such as uric acid, which seems to cling tenaciously to protein precipitates and which decreases the apparent rotatory power of the protein by increasing the nitrogen-content of the solution. Further, the solutions examined were very dilute; in general the rotations measured were only about $0·4°$, and in one case only $0·08°$. This, of course, increases the experimental error, perhaps in some cases to nearly 30 per cent. It would also seem possible that lactoglobulin and caseinogen might accompany the milk albumin if the milk secretion were deranged and lactalbumin passed into the blood stream and thence through the kidney. No one has observed this phenomenon.

Thomas, Schlegel, and Andrews (1928) suggest that in albuminuria the first stage is liver damage caused by circulation of toxins; liver proteins pass into the blood stream and leak through the kidney into the urine. The kidney becomes damaged by the passage of foreign protein and serum proteins then leak through the kidney into the urine. Our results suggest that no abnormal liver albumin occurs in the urine of nephrosis, albuminuria of pregnancy, and eclampsia, and the globulin fraction, where liver proteins might occur, is generally very small. In addition, it is shown that the passage of some foreign proteins through the kidney for long periods does not appear to cause leakage of serum albumin. In the present paper the purification and examination of the proteins in the urine of a few cases of nephrosis, albuminuria of pregnancy, and eclampsia, and some details of cases of myelomatosis are described.

Preparation of Urine Albumins.

In some cases dilute urines were first concentrated by ultrafiltration as previously described (Hewitt, 1927 [2]); in others the fresh urines, after filtration through filter paper, were subjected to the following processes, all conducted as expeditiously as possible to avoid proteolytic, bacterial, and chemical changes in the protein.

Instead of adding sufficient ammonium sulphate crystals to saturate the urine—not a very satisfactory process—saturated ammonium sulphate was added to the urine up to about 70 per cent. saturation, and the pH was adjusted to 4·7 by adding 10 per cent. acetic acid. In this way all the albumin was precipitated and there was no difficulty in dissolving crystals. Next morning the precipitate was filtered off on a buchner funnel and dissolved in a small quantity of water, and the solution was neutralised, cooled to 0° C., and added drop by drop to 7–10 volumes of a mixture of absolute alcohol (7 vols.) and ether (3 vols.) cooled to $-15°$ C. After being allowed to stand in a mixture of ice and salt at low temperature for 1–2 hours the precipitated proteins were filtered off on a chilled buchner funnel in the ice chest, washed thoroughly with an alcohol-ether mixture and with ether, both being cooled to $-10°$ C. and then transferred rapidly to a Soxhlet thimble and extracted with ether for two hours, sodium metal being placed in the extraction flask to prevent any extracted alcohol from refluxing. The dried proteins are not denatured by ether. The presence of ammonium sulphate in the protein facilitates and accelerates the filtration. After two hours' extraction the ether and sodium were renewed and the extraction continued for a further 18 hours. The proteins were then transferred to a vacuum desiccator and dried in vacuo over sulphuric acid for 48 hours. After being allowed to remain in contact with the atmosphere for 24 hours the proteins dissolved readily in water, leaving a small amount of insoluble material (uric acid, &c.). The ammonium sulphate concentration was then adjusted to 50 per cent. by addition of saturated ammonium sulphate solution. The precipitation was allowed to continue overnight, and then the precipitated globulins (only a small proportion of the total proteins) were filtered off on a buchner funnel, a hardened filter paper being used. The albumin in the filtrate was precipitated by adding a further quantity of saturated ammonium sulphate solution and adjusting the reaction to pH 4·7. The precipitation was allowed to continue overnight, and then the precipitated albumin was filtered off on a hardened filter paper in a buchner funnel. After two repetitions of this precipitation the albumin was dissolved in about 12 c.cm. of water and placed in a tested collodion sac sealed by means of rubber pressure tubing attached by a rubber band and closed by a piece of glass rod. The proteins were dialysed against distilled water for at least ten days,

* Working under the auspices of the Freedom Research Fund.

the outside fluid being changed constantly the first day and then daily. At the end of this time all the ammonium sulphate had dialysed out. The solution was then filtered through a Seitz filter, a clear, sterile fluid with a yellow or brownish colour being obtained.

Optical Rotatory Powers.

Rotations were determined by means of a Schmidt and Haentsch polarimeter with a tripartite field and a direct vision spectroscopic eyepiece fitted by Hilgers. The light sources employed were a mercury-vapour lamp ($\lambda = 5461$—5780 A.U.) and a Nernst lamp with colour filter ($\lambda = 6660$ A.). In Tables I. and II. rotations are quoted for a 1 dm. tube, except where otherwise stated.

TABLE I.—*Observed Rotations.*

Case.	Protein concentration (percentage)	$\alpha\lambda$		
		λ 6660	λ 5780	λ 5461
1	2·00	−1·00°	−1·33°	−1·54°
2 (*a*)	3·29	−1·62°	−2·28°	2·63°
2 (*b*)	1·74	0·79°	1·17°	1·35°
2 (*c*)	1·26	0·63°	0·90°	1·02°
3	3·99	1·91°	2·75°	3·14°
4	2·89	1·31°	1·96°	2·17°
5	4·87	2·39°	3·38°	3·80°
6	3·78	1·67°	2·60°	2·94°
7	4·50	0·82°*	1·21°*	1·38°*
8	2·60	1·15°	1·67°	0·79°*

(*a*), (*b*), (*c*) = specimens.
* Denotes 4 cm. tube used in place of 1 dm. tube.

TABLE II.—*Specific Rotatory Powers.*

Case.	Diagnosis.	$[\alpha]\lambda$ $\lambda = 6660$	5780	5461 A.U.
1	Nephrosis.	−50·0°	−66·7°	−77·0°
2 (*a*)		49·2°	69·2°	79·9°
2 (*b*)		45·3°	67·1°	77·4°
2 (*c*)		50·0°	71·5°	80·9°
3		47·8°	68·9°	78·6°
4		45·3°	67·8°	75·1°
5	Albuminuria of pregnancy.	49·1°	69·4°	78·0°
6		44·2°	68·8°	77·8°
7	Eclampsia.	45·6°	67·3°	76·7°
8		44·2°	64·3°	76·0°
Mean value (urine albumin)		−47·1°	−68·1°	−77·7°
Serum albumin (Hewitt, 1927 [1])		−47·3°	−67·0°	−78·1°

It will be seen that the optical rotatory powers of the urinary albumins in nephrosis, albuminuria of pregnancy, and eclampsia were, within the limits of the experimental error, identical with that of serum albumin. The rotatory powers for green light ($\lambda = 5461$ A.U.) are those most accurately determined. It is more difficult to match the filtered red light and the yellow line is a doublet.

The refractive indices of urine and serum albumin are not distinguishable (Table III.).

TABLE III.

—	—	T° = 17° C. Concentration per cent.	n_D of soln.	—	Calculated n_D of 100 per cent. protein.
Case 7.	Eclampsia.	4·5	1·3422	0·0090	1·583
,, 8.	,,	2·6	1·3385	0·0053	1·582
Ser. alb.	Normal.	7·45	1·34835	0·01515	1·586

Mr. Smith, of the London Hospital Medical College, has examined the ultra-violet absorption spectra of some of these preparations and found them indistinguishable from serum proteins. A few notes on the cases follow (Table IV.).

TABLE IV.

Case.	Sex.	Age.	Blood-urea.	Urine urea concentration.	P.S.P. excreted in three hours.	Albumin volume in urine.
			Per cent.			
1	M.	34	0·041	2·16	47	Three-quarters.
2	M.	26	0·050	>2·0	>50	Half.
3	F.	22	0·070	2·0	46	—
4	M.	31	0·138	1·0	Trace.	Half.
5	F.	23	0·040	>2·0	>50	,,
6	F.	27	0·030	>2·0	>50	,,

CASE 7.—Female aged 34. Eclampsia. No previous miscarriage; two children. Dec. 3rd, 1927: eight months pregnant; blood pressure, 200. Unconscious and twitching; urine solid with albumin, one fit. 4th: improved after stomach and colon wash. 5th: normal fœtus born dead. 7th: urine—albumin half volume. Blood-urea, 0·021 per cent. Urine-urea concentration, 3·84 per cent. 11th: blood pressure, 150. 13th: albumin cloud only.

CASE 8.—Female aged 30; eclampsia; one child; no previous miscarriage. Dec. 6th, 1927: 32 weeks pregnant, no albuminuria or vomiting; some hæmorrhage. Blood pressure, 120. Jan. 5th, 1928: further hæmorrhage; vomiting; albumin two-third volume; blood pressure, 220; slight œdema; two fits. Fœtus born in rigor mortis. 9th: slight trace of albumin; blood pressure, 160/115. Urine samples examined were taken just before and after fits.

Myelomatosis.

CASE 1.—Male aged 46. Spontaneous fracture of right tibia. X ray examination showed typical moth-eaten appearance of bones, especially femora, pelvis, and skull. Lost 21 lb. in two years. Examination of the blood on various occasions indicated a severe degree of secondary anæmia, but the differential counts were not significantly abnormal. The serum calcium (12·8 mg. per 100 c.cm.) was slightly high, as might be expected in a case of bone breakdown. The serum proteins were normal in amount: albumin, 4·35 per cent.; pseudoglobulin, 1·31 per cent.; euglobulin, 0·65 per cent.; total, 6·31 per cent. A trace of Bence-Jones protein was, however, detected in the serum. None of the abnormal protein was detected in the cerebro-spinal fluid, which was normal in composition (determined by the method previously described, Hewitt, 1927 [3]): albumin, 0·031 per cent.; globulin, 0·003 per cent.; total, 0·034 per cent. Blood fragility and clotting time were normal. It would be expected, and it was found, that since Bence-Jones protein is excreted by the kidney some must appear in the blood stream. The non-appearance in the cerebro-spinal fluid is also not surprising. Considerable amounts of the protein have been passed continuously into the urine (Table V.).

TABLE V.

Date.	Volume of urine in c.cm.	Protein per cent.	Quantity passed in 24 hours.
19/10/26	700	2·0	14 g.
20/10/26	800	1·5	12 g.
11/11/26	2500	0·64	16 g.
30/11/26	3600	0·68	24·5 g.
8/11/26	2600	0·56	14·6 g.
6/ 1/27	4000	0·64	25·0 g.
8/ 4/27	3250	1·09	35·4 g.

Large quantities still appear continuously in the patient's urine, but from 1926 until the present day no albumin has been detected and, although renal functional tests indicate kidney damage, the damage is not becoming more marked but is rather decreasing (Table VI.).

TABLE VI.

Date.	Blood-urea per cent.	Maximum urea concentration in urine, per cent.	Percentage P.S.P. excreted in three hours.
29/11/26	0·067	0·54	17·5
5/ 4/27	0·054	0·72	27·5
10/ 2/28	0·079	1·68	34·4

Continuous passage of large quantities of a foreign protein does not therefore appear to cause leakage of serum albumin into the urine. The patient is still alive and not confined to bed.

CASE 2.—Female aged 66; eight children alive and healthy. Several spontaneous fractures caused by trivial accidents. X ray appearance showed extensive rarefaction of bones, including femora, humerus, skull, ribs, left shoulder (where a fracture had occurred), eighth dorsal vertebra, and collapse of head of tibia and fibula. Blood examinations indicated a slight degree of anæmia. The serum calcium was normal—i.e., 9·4 mg. per 100 c.cm. Less Bence-Jones protein was found in the urine than in the previous case, but it has always been and is still present continuously (Table VII.).

TABLE VII.

Date.	Urine volume in c.cm.	Protein per cent.	Quantity passed in 24 hours.
10/10/27	300	0·8	2·4 g.
3/28	200	0·7	1·4 g.

On no occasion has albumin been detected in the urine, and renal functional tests indicate little kidney damage if any.

Date.	Blood-urea.	Maximum urea concentration in urine.	P.S.P. excreted in three hours.
20/3/28	0·03 per cent.	1·68 per cent.	55·6 per cent.

The passage of Bence-Jones protein has not caused progressive kidney damage, nor have detectable amounts of albumin appeared in the urine. The patient is confined to bed.

CASE 3.—Male. Typical X ray appearance. Bence-Jones protein excreted continuously in urine for several years; no albumin detected. The patient was able to carry on a practically normal existence.

CASE 4.—Female aged 51. X ray examination showed typical rarefaction of scapulæ, clavicles, ribs, vertebræ, and most other bones. Pain in back and legs for four years. Blood examination showed some degree of anæmia and slight poikilocytosis and anisocytosis, but no nucleated erythrocytes. Considerable amounts of Bence-Jones protein were excreted. The patient was confined to bed and died on discharge from hospital.

CASE 5.—Male aged 59. Pain in back and under sternum. X ray examination revealed slight rarefaction of upper end of the medulla of the right radius, and of the occipital region of the skull, and some expansion of the sternal end of the right ribs. Splenectomy was performed, and the spleen appeared enlarged but not otherwise abnormal. The blood examinations showed lymphatic leukæmia and some anæmia. Serum calcium was within the normal limits: 9·71 mg. per 100 c.cm., and the blood fragility was normal. A considerable amount of Bence-Jones protein appeared continuously in the urine.

A detailed study of the properties of Bence-Jones proteins is being made, and will be reported subsequently. In every case the urine contained protein, which coagulated on heating at an abnormally low temperature, but in Cases 1 and 2 the protein did not redissolve except under very special conditions. The failure of a urine protein to redissolve on boiling the solution does not therefore exclude the possibility of myelomatosis. The proteins possess properties similar to pseudo-globulin, and different proteins appear to be excreted in different cases.

Discussion.

The albumin in the urine of patients with nephrosis, albuminuria of pregnancy, and eclampsia are indistinguishable from serum albumin. In these diseases, therefore, kidney damage occurs and serum albumin leaks through unchanged. The consequent reduction in serum albumin and the lowering of the osmotic pressure of the blood account for the œdema. In the two cases of eclampsia studied no evidence was obtained of the presence of lactalbumin in the urine as found by Hynd (1925). Admittedly the number of cases is very small indeed, but there seems no reason why milk albumin should be excreted in some cases and serum albumin in other cases clinically indistinguishable from them. Also the absence of any appreciable amount of caseinogen and lactoglobulin from the urines studied by Hynd may support this view.

The fact that continuous passage of a protein—i.e., Bence-Jones protein—through the kidney for long periods does not cause progressive kidney damage or leakage of serum proteins is evidence against the view that albuminuria in general begins by damage to the liver and leakage of liver proteins through the kidney, and that this causes kidney damage resulting in leakage of serum proteins.

The origin of Bence-Jones proteins remains obscure, particularly since they appear to have different properties in different cases and are not all dissolved on boiling.

Conclusions.

1. In the few cases studied no difference could be detected between serum albumin and urinary albumin excreted in nephrosis, albuminuria of pregnancy, and eclampsia. In these cases, therefore, serum albumin probably leaks through the kidney unchanged.

2. Passage of large quantities of Bence-Jones proteins through the kidney for long periods does not produce progressive kidney damage, and does not appear to cause leakage of serum albumins. It is probable, therefore, that the passage of foreign proteins through the kidney does not cause leakage of serum albumin.

3. Bence-Jones proteins differ in properties and are not all soluble in boiling solution. The protein appears to be present in the serum but not in the cerebro-spinal fluid. The albumin and globulin content of the blood and cerebro-spinal fluid are not abnormal in myelomatosis.

The author is indebted to Dr. Lewis Smith, Surgeon-Commander F. G. Hitch, R.N., Dr. J. W. McNee, Dr. Janet Vaughan, and the physicians and surgeons of the London Hospital for permission to quote the cases described, and to Dr. J. R. Marrack for his help and interest.

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THE MECHANISM OF THE STOKES-ADAMS SYNDROME.

AS ILLUSTRATED BY THREE CASES.

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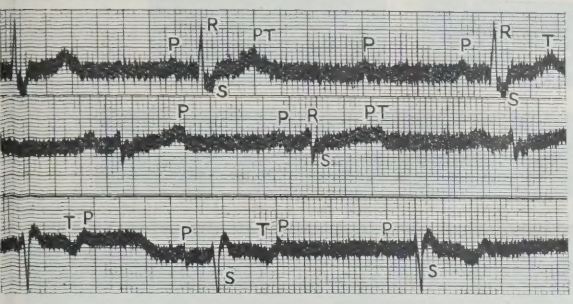
DURING the years 1925–1926 three cases exhibiting the Stokes-Adams syndrome were admitted to the Johannesburg General Hospital. The electrocardiographs of these patients throw some light on the mechanism which produces the syndrome.

CASE 1.—A farmer, aged 66, was admitted to the Johannesburg General Hospital under Dr. A. Watt on Sept. 28th, 1925, for "rheumatism." This had crippled him for the preceding ten months, and the enforced inactivity accounted for the absence of cardiac symptoms. His heart was slightly enlarged to the left, but there were no thrills or murmurs. The blood pressure was 160/95, Wassermann negative, and urine normal. The pulse-rate was 40, sometimes irregular, and on this account an electrocardiograph was taken. This showed a varying 2/1 and 3/1 heart-block (see Fig. 1) with left ventricular preponderance. The auricular rate was not regular in this graph. On Oct. 20th the teeth were removed on account of root sepsis. On the 30th complete auriculo-ventricular dissociation was present, with a ventricular rate of 36 per minute. Adrenalin hydrochloride hypodermically made no difference to the amount of block in the tracing. It was noticed that there were progressive changes in the character of the first ventricular complexes, and that left bundle block set in. Apparently an active myocarditis was in progress.

On Nov. 10th the patient had the first of a series of Stokes-Adams attacks, which occurred daily until Dec. 10th. These were typical in form and corresponded to a complete cessation of pulse. Some attacks lasted a few moments, others as long as 42 seconds. At one time there were as many as 20 attacks in one day. Fig. 2 shows complete cessation of ventricular action in lead III. and also exhibits a change in the Q R S complexes in leads I. and II. when compared with Fig. 1. Chart I. is a reproduction of a bromide paper record taken over a long period in the same day. This curve, and a similar one obtained in Case 2, were taken

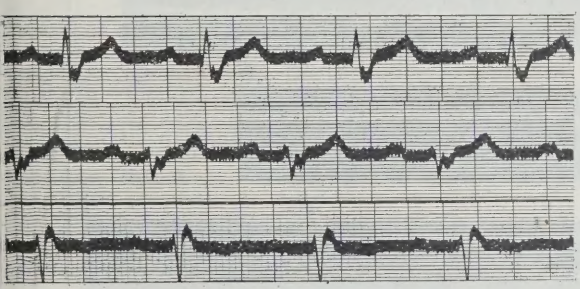
FIG. 1 (Case 1).



2/1 and 3/1 auriculo-ventricular block. (Time 1/5 and 1/25 sec.)

by applying the electrodes to the right arm and left leg of the patient in bed (lead II.). They are read from right to left; the scale is approximately 1 in. to 4 secs. in this case. The first row A D of this record shows a standstill of the ventricles for a period of 15 secs., interrupted only by two dissimilar extrasystoles B and C. This is succeeded in the second row by a period of 2/1 block E F and 1/1 block G H. Both the auricular and ventricular rates vary in these two portions of the curve. The tracing I R is continuous. There is inactivity of the ventricle from I to Z, a period of 34½ secs. The period I J shows regular auricular beats interrupted by fibrillary movements. J X is a fit movement followed by the period X K L where only auricular beats occur. In the period L P there are three fit movements, the first of which lasts 4/5 secs., the second

FIG. 3 (Case 1).



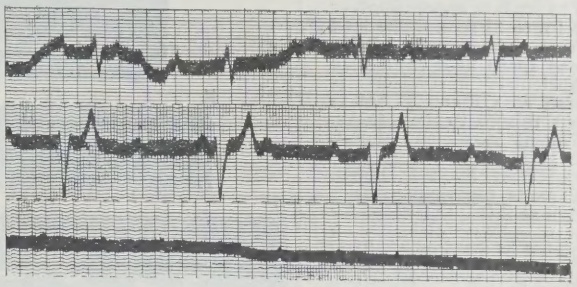
one 3/5 sec., and the third one 7 2/5 secs. These are separated at N and O by auricular beats, each for periods of 2 1/5 secs. At Z 2/1 block again sets in, with the type of Q R S complexes prevailing that day. This tracing shows clearly that the fits occur during periods of ventricular inactivity.

The fibrillary movements from I to J cannot be instrumental in character, as they are not apparent in the ventricular complexes. The auricular rate in the curve varies considerably only at G H. During the days that Stokes-Adams attacks were present (as gauged from cardiographs not published), the auricular rate varied from 72 to 88 per minute. Auricular rate had no influence in determining 2/1 or 3/1 block. The auricular rate at the beginning of the whole series of photographs was 80 per minute, and at the end of the series 66 per minute. Later cardiographs show reappearance of Q R S complexes similar to those present on admission. The last tracing (cardiograph 3) shows 1/1 rhythm, the P/R interval only being lengthened. The last Stokes-Adams attack was on Dec. 10th, about five weeks before discharge from hospital. The blood pressure had fallen from 160/95 to 135/75, the block was 1/1 consistently, and the patient's general health was greatly improved.

Drug Treatment.—Atropine sulphate, gr. 1/150, seemed to be more help than adrenalin hydrochloride, and was given twice a day from Nov. 22nd to Dec. 9th, 1925, and thereafter when necessary. Thyroid and barium chloride were also exhibited.

There was, therefore, on admission old myocardial mischief which went through a period of acute

FIG. 2 (Case 1, same day as Chart I.).

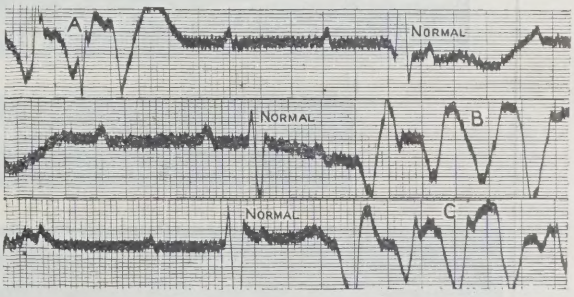


Complete ventricular standstill, third lead. (Time 1/5 and 1/25 sec.)

exacerbation on both clinical and electrocardiographic evidence. The acute exacerbation cleared up and the cardiac condition improved. The question of its association with oral sepsis arises.

CASE 2.—Female, aged 57, had been admitted with cystitis during the year 1920. In 1926, three months before admission into Dr. Watt's ward, she had suffered from shortness of breath. Shortly before admission she herself had noticed irregularity of the heart-beat and had had some attacks of unconsciousness. On August 13th, 1926, while she was attending as an out-patient for her medical condition, her pulse was found to be beating at the rate of 40 to the minute. Electrocardiographic examination showed that 2/1 auriculo-ventricular block was present.

FIG. 4 (Case 3).



Paroxysmal ventricular fibrillation. (Time 1/5 and 1/25 sec.)

Besides the breathlessness there were no other symptoms or signs of cardiac decompensation.

She was admitted to hospital for investigation on Sept. 17th, 1926. There was no obvious enlargement of the heart and no thrills or bruits were detected. There were, however, many dropped beats, and a short sharp sound was heard midway in the ventricular pause and was most marked at the fourth interspace, just to the left of the sternal margin. The duration of the sound was notably less than that of the first heart sound. It was presumed that this was an auricular sound, on account of its position in the cycle and also on account of the presence of 2/1 block according to the electrocardiographic record taken at the time.

On Sept. 25th she had six fits of the Stokes-Adams variety, one lasting two minutes. During the long attack Dr. Watt injected 10 minims of adrenalin hydrochloride into the left ventricle and the patient revived.

On Sept. 26th, 1926, she had three attacks; on the 27th, two; on the 28th, three; and on Oct. 4th she had six attacks, each lasting from 10 to 40 seconds.

During an attack the patient became flushed and then very pale and breathed very heavily. Loss of consciousness with fit movements followed, the pupils became dilated, the conjunctival reflex was lost, and the respiration became slower. The face flushed once more on the first beat.

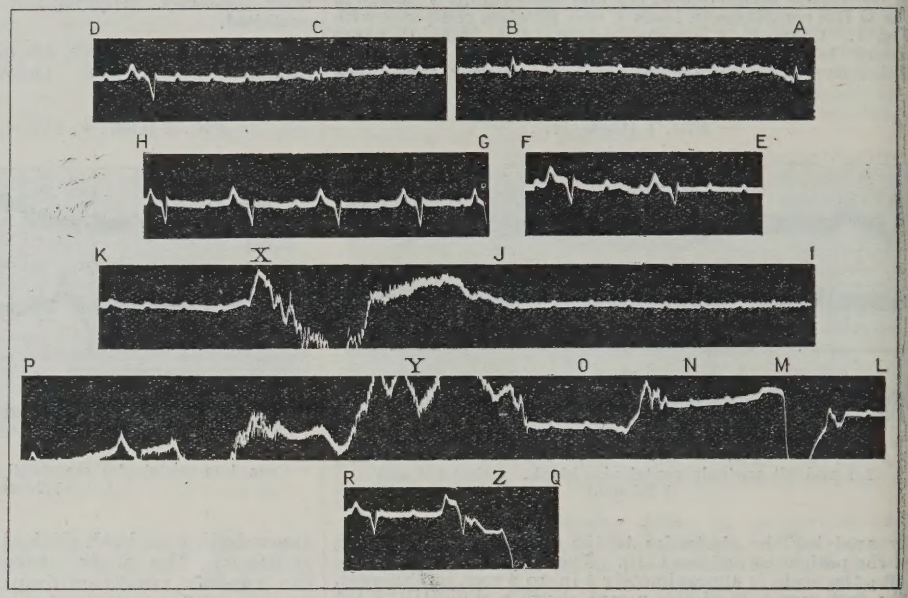
Cardiographs taken during the hospital period showed a progressive change in the Q R S complexes.

Chart II. is a reduced copy of a bromide paper tracing taken on Sept. 28th, ten days before death. The scale is approximately 3 in. to 11 secs. The lead from right arm to left leg was again used (lead II.). Auricular fibrillation is seen at X F and Y, but is not related to the attacks. The fit movement at K L is succeeded by 1/1 block and then by 2/1 block. There is ventricular standstill at Z O P Q (except for two extrasystoles) for a period of 8 1/5 secs. This is followed by a fit movement Q R. Complete block ensues in which the auricular rate is not regular, and this passes into 2/1 block, the dominant rhythm. There is slowing of the ventricle when ventricular standstill has passed away. Ectopic ventricular beats occur at times during the tracing, but they are not related to the attacks, nor do they conform to any Q R S complexes seen in graphs taken previously.

From admission onwards albumin, blood, and pus were found daily in the urine. The infecting organism proved to be a streptococcus which presumably caused the myocarditis. The Wassermann reaction was negative.

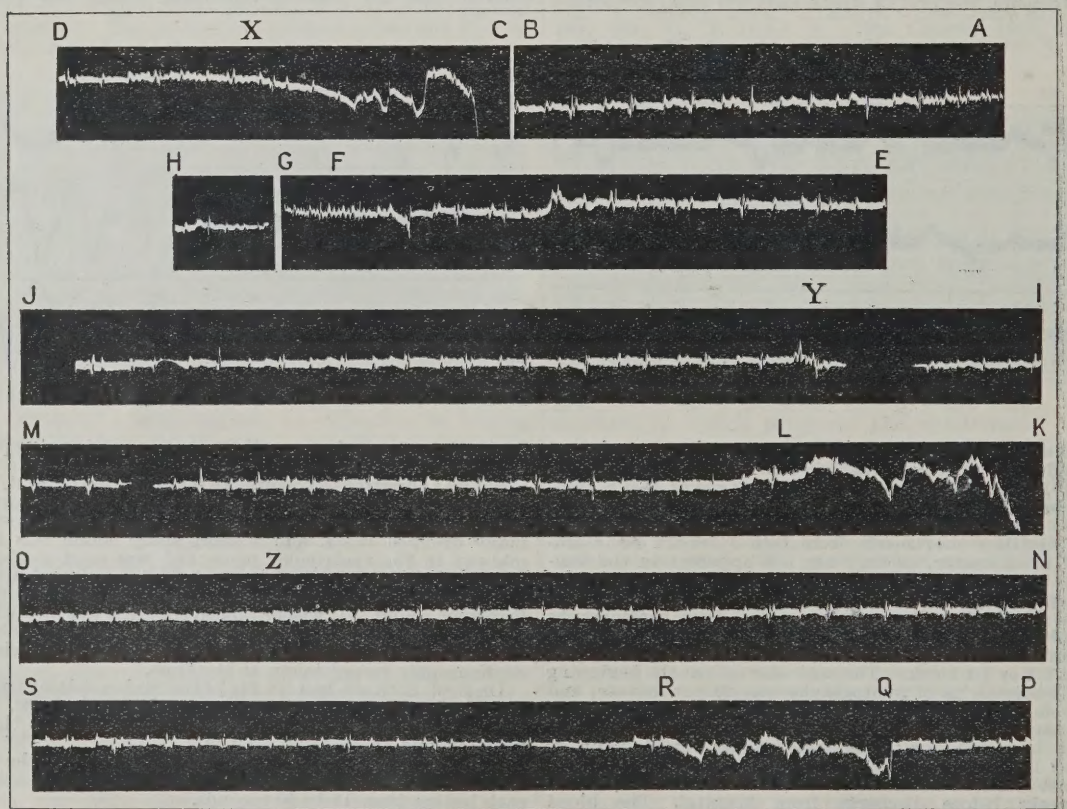
Drug treatment similar to that in the first case was of no avail. She died on Oct. 7th, 1926. No post-mortem examination was allowed.

CHART I.



CASE 3.—Female, aged 46, complained of difficulty in breathing and palpitation for three weeks before admission under Prof. O. K. Williamson. On admission her pulse-rate was 60 and dropped to 30, and finally settled down to a rate between 28 and 30. Her systolic blood pressure was 195 and the heart was greatly enlarged to the left, but there were no valvular murmurs. She had the typical spaces in

CHART II.



the rhythm denoting dropped beats of a partial heart-block. During her stay in hospital she had several attacks of unconsciousness, and the electrocardiograph showed complete auriculo-ventricular block with a right bundle lesion. Later cardiographs show a change of state of the ventricular complexes in lead II., and this is evidence once more of an acute myocarditis.

She was discharged and readmitted after a period of six weeks, as she had had recurrence of the unconscious attacks for a week previously. Her attacks were characterised by breathlessness, cyanosis, and a period of unconsciousness of a few seconds (generally about ten), during which the pulse was imperceptible. She had several attacks during the next few days and died in one of them. No post-mortem was allowed.

Fig. 4 shows three small attacks, A, B, and C. It will be noted that these are totally unlike the graphs of the attacks in Cases 1 and 2. There is no sign of auricular fibrillation or ventricular standstill, but there is a sudden occurrence of ventricular fibrillation, which stops as suddenly as it begins.

Treatment with barium chloride by mouth, and adrenalin hydrochloride solution hypodermically, did not seem to be of any avail.

Analysis of Cardiac Phenomena.

Auricular Effects.—Auricular fibrillation was noted in Cases 1 and 2. This condition of the auricle bears no constant relationship to the incidence of attacks, so that it cannot in itself be the cause of them.

The auricular rate does not constantly vary before an attack and cannot be the precipitating factor. Also, it is the same during an attack as it was just before (Chart I.).

Ventricular Effects.—There is a continuous variation in the shape of the Q R S complexes throughout the series of cardiographs in Cases 1 and 2; there is also some variation in Case 3, when a right bundle block is present ab initio. In all the cases there is electrocardiographic evidence that tracts of inflammatory tissue are occurring in the course of the bundle of His. We suggest that the Stokes-Adams phenomena are dependent in some way on this. In Case 3 the inflammatory lesion has gone so far in the ventricle as to produce paroxysmal ventricular fibrillation.

Woolard [1] has worked out the innervation of the coronary vessels from an anatomical point of view. The physiological researches of Anrep and Segall [2] have demonstrated "the presence of vaso-constrictor fibres to the coronary blood-vessels in the vagi and of vaso-dilator fibres in the sympathetic nerves." Osler [3] comments that "the origin of the condition (Stokes-Adams syndrome) is probably vagal." It is apparent in all the cases that there is no sinus showing before an attack, for the auricular rate does not drop. The syndrome is not produced by vagal effects on the sino-auricular node. So far as we know, the auriculo-ventricular node "follows suit" to the sino-auricular node and is necessarily governed by the same influences. Hence it follows that the ventricular standstill is not due to a direct vagal effect on the auriculo-ventricular node. Assuming that the vaso-dilation of the skin found in Case 2 is evidence of sympathetic inhibition proportionate excess of vagal tone may be inferred. This should produce vaso-constriction of the coronary arteries. I suggest that the effect of vaso-constriction of the coronary arteries on the actively diseased myocardium is to produce ventricular asystole in Cases 1 and 2, and ventricular fibrillation in Case 3.

It is interesting to note that Anrep and Segall [2] note a difference in the properties of the vagal fibres controlling heart-rate and coronary flow respectively. "The vagal fibres controlling the heart-rate and those which regulate the coronary blood-vessels react differently to atropine. A small dose of atropine does not prevent the coronary effect, but it abolishes the effect on rate. A larger dose of atropine cuts out both effects."

Let us examine by considering the therapeutic action of the drugs what support is lent to the supposition that coronary constriction precipitates Stokes-Adams attacks. Atropine sulphate and adrenalin hydrochloride are both used to alleviate the attacks. Adrenalin only of the two has a direct action on the cardiac musculature in clinical doses, but both overcome an excess of vagal tone, atropine by paralysing the vagal ends and adrenalin by stimulating the sympathetic. It is logical to assume that it is just this common mechanism which is brought into play by the use of these drugs. Support is also lent to this idea by Case 1, where atropine was the more effective drug of the two. According to the work of Anrep and Segall, both these drugs should produce dilatation of the coronary arteries by their action on the autonomic nervous system—a conclusion which agrees with the speculation already advanced.

I would therefore put forward, as a hypothesis, that in a certain group of cases exhibiting the Stokes-Adams syndrome the underlying cause is an acute myocarditis and the precipitating cause is a vaso-constriction of the coronary arteries, depending on the action of the autonomic nervous system. The same factors may also be at work in those cases which exhibit occasional attacks over a period of years, if the inflammatory myocardial lesion exhibits acute exacerbations at various intervals. Such a case has not been described here. I have compared the electrocardiographs of these cases with that of Herapath,[4] published in THE LANCET. I cannot ascribe the incidence of the attacks in my cases to the presence of an ectopic irritable point in the ventricle such as Herapath describes.

I wish to thank Prof. O. K. Williamson, Dr. Watt, and Dr. I. Block for their courtesy in allowing me to use their cases and notes, and to Dr. L. R. Shore for his valuable criticism of the text.

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Clinical and Laboratory Notes.

A NOTE ON THE QUIESCENCE OF IRRADIATED TUMOUR CELLS.

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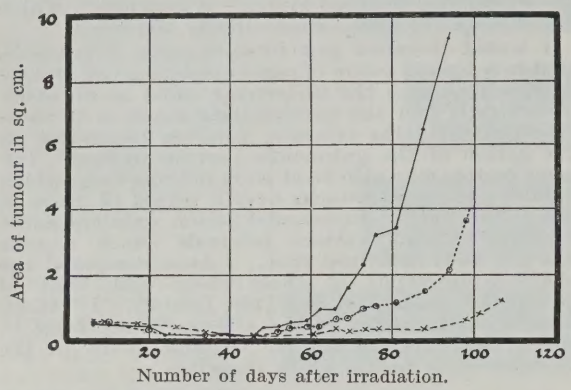
IN 1913 we published[1] the results of some experiments upon the ultimate fate of tumour cells (Jensen's rat sarcoma) after exposure to radium emanation.

When these cells were irradiated outside the body and then inoculated subcutaneously into rats, it was found that, after a "lethal dose," the irradiated cells were able to survive in the body for a period of about eight to ten days, after which very little trace of them could be found. When sub-lethal doses were given, the irradiated tumour cells grew, but at a reduced rate, and the onset of growth was often very much delayed. The extent of this delay in growth, a real quiescent period, may be gauged from the charts of three tumours shown in the figure, which are reproduced from the data given in the paper mentioned.

In the cases illustrated, 0·1 c.cm. of tumour cells was exposed to 0·275 millicuries for 30 minutes before being inoculated. It will be seen that the irradiated cells in one of the tumours showed practically no sign of active growth for something like 80 days, a considerable fraction of the life of a rat.

[1] Proc. Roy. Soc., Series B., 1913, lxxxvi.

Clinically, it must often be impossible to ensure that the cells of a tumour all receive the dose which is considered necessary to ensure a lethal effect, and the question naturally arises whether the cells which receive sublethal doses are likely to go through some similar period of quiescence only to renew their growth eventually. There is little doubt that, in a large proportion of the cases, the normal tissue reactions of the host play the important part of dealing effectively with damaged tumour cells, thus making



recurrences rarer than they would be, if one relied simply upon the direct effect of the rays upon the tumour cells. A striking parallel to this experiment has lately come to our notice, and seems worth recording.

In January of 1921 a woman of 73 was admitted to the wards of the Middlesex Hospital with a tumour in the right breast. This was removed by the late Mr. T. H. Kellock, and sent over to the laboratory under aseptic conditions. The tumour tissue was separated as far as possible from the normal tissues, and was then minced into a sterile petri dish and exposed to a beam of X rays. The dose given to the cells was calculated to be 1·5 times that given to the rat sarcoma cells for a lethal effect. A section of the tumour tissue showed it to be a colloid carcinoma.

After irradiation, 15 c.cm. of tumour tissue in all were inoculated intramuscularly in two abdominal pockets prepared at the time of the operation. The object in view was to try to induce a state of immunity in the patient by the absorption of irradiated tumour cells; the experimental basis of this was described in THE LANCET (1922, i., 212). Six and a half years after this operation was carried out the patient felt some very small nodules on the right side of the abdomen at the site of the inoculation. She said nothing about it till nearly six months later, when the nodules were plainly visible and evidently growing very slowly; nothing could be felt on the left side. There is hardly a doubt that these nodules represent growth of the tumour cells inoculated seven years ago, and which have been in a state of quiescence for all these years. The renewed activity of these cells appeared to coincide with the recurrence of nodules at the site of the original operation on the breast. The patient remains in good general health.

A NOTE ON TRAUMATIC RUPTURE OF THE SPLEEN.

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IN tropical countries rupture of the spleen is fairly common. It will certainly be missed if the possibility of it is not considered in all cases of falls from a height, internal and external violence, and accidents by tram-cars, railway trains, motor-cars, &c. Even when injury is inflicted on parts other than the abdomen the spleen may be ruptured. In one case of fracture of the base of the skull rupture of the spleen was revealed at autopsy. In every case of injury to the skull, especially those due to falls from a great height, a careful examination of the abdomen is imperative. The high incidence of this accident in the tropics is perhaps due to the prevalence of certain tropical fevers of which the most important is malaria. I say "perhaps" because a small, apparently normal spleen with normal consistency has been found ruptured more than once. It may be conjectured that tropical spleens are certainly more vulnerable than those of dwellers in cold countries. I have not been able to show malarial changes in all the nine spleens I have removed in two years of Sir J. J. Hospital surgical practice.

Diagnosis.

Pulse.—This is no guide at all. When a small, quick, running pulse is present there is no question, but a good pulse of normal rate and volume may be consistent with a rupture of the spleen. Twice I have opened up the abdomen when a pulse of normal rate and volume was present and found rupture of the spleen. One should not wait for a "hæmorrhagic" pulse to diagnose rupture of the spleen.

Restlessness.—This is usually, though not invariably, present. In seven cases out of nine it was present to a varying degree. If the patient is admitted during the night and the house surgeon misses the diagnosis, the surgeon next morning on his round invariably obtains a history of restlessness during the night. The cases that have passed a restless night do not live as exploration comes too late.

Thirst.—In all my cases this symptom was constant, and I attach great value to it.

Dullness.—This physical sign is very much overrated. It is present in practically all cases, but its absence should not negative the diagnosis. Twice I have obtained a tympanitic note over the left iliac fossa, due to gas in the bowel and atony of the gut. Increasing and shifting dullness may be a valuable sign for some observers, but I must admit that I have not had much help from it.

Rigidity.—This sign is variable, depending more or less upon the amount of trauma suffered by the parietal peritoneum and not upon the quantity of extravasated blood present in its cavity. In most of my cases it was absent. In fact if rigidity is present I am sceptical of the diagnosis of splenic rupture. In one case of contusion of the abdominal wall where rigidity was very well marked I waited, and was not sorry for it.

Pain and Tenderness.—To me this is the most important and most infallible sign. It is surprising that so little stress has been laid on this point in surgical text-books. In almost all cases I have asked the patients: "*Kya hei?*" (What is the matter with you?) and they have uniformly answered "*Idhar hei*" (here it is). There is a definite tender spot about the left hypochondriac region. I have been much helped by this statement, and I always depend on it. Before operation I confirmed the diagnosis by putting a wide-mouthed needle into the peritoneal cavity. I have always found blood, although sometimes only after three punctures. I consider this procedure absolutely safe and surgical, considering the gravity of the situation.

The Technique of the Operation.

The abdomen is opened by a long left paramedian incision under light ether and local anæsthesia. The blood is mopped up with sponges and collected in a sterile bowl containing saline. Blood effused from a ruptured spleen, like extensive hæmothorax fluid, does not coagulate. Slight coagula may be found at the site of rupture, but the blood obtained from the pelvic cavity is all fluid. This blood is injected straight into the vein of the patient after it has been mixed with warm saline. The spleen is rotated on its axis medially and thus the hilum is brought nearer the surface of the wound, and the structures contained in the lienorenal ligament are ligatured in sections. The gastrosplenic ligament is easily separated, and a certain amount of traction has to be used in bringing the upper pole of the spleen into the wound. In the majority of cases removal is easy. Suturing the rent in the spleen is extremely difficult and risky, and should not be attempted, as it entails further hæmorrhage. Sometimes the two halves of the spleen come away separately. The commonest site of rupture is at the anterior border close to the hilum. In one case a vertical tear was found and three cases presented laceration of the lower pole below the hilum. I do not think it is possible to stop bleeding by suturing these areas, which are so friable that sutures will not hold. To my mind excision is the best treatment of an injured spleen which has caused severe bleeding, no matter how insignificant the injury.

The liver, stomach, and intestines should be carefully examined before the abdomen is closed. In one case a rent in the liver was missed and the abdomen had to be opened up again. Ligatures are left long and used as tractors, so that if there is oozing from the hilum fresh bleeding points can be easily secured. They are cut short as a last step before the abdomen is closed.

Rupture of the spleen associated with dilatation of the stomach is a very grave accident and usually fatal. The force that ruptures the spleen paralyses the stomach without any bruise or hæmorrhage on its walls. In one such case where the stomach ballooned out the patient died within 48 hours of the operation. Bruising of the gastro-splenic omentum is not so dangerous as dilatation of the stomach. In one patient I successfully ligated the bruised portion of the omentum in sections. The possibility of including the tail of the pancreas in the hilum is very much exaggerated as the fixation of the pancreas to the posterior abdominal parietes prevents it. As a rule one does not see the pancreas when the spleen is completely brought out into the wound.

Results and Conclusions.

The results on the whole have been very encouraging, but early diagnosis would certainly improve them. Five out of my nine cases recovered, the causes of death in the other four cases being dilatation of stomach, fracture of the base of the skull, delay before operation (the patient had a restless night as the house surgeon did not recognise the situation), and injury to the liver, which was not noticed.

A CASE OF ACTINOMYCOSIS OF THE APPENDIX.

BY FRANCES M. G. SINCLAIR, M.B. ABERD.

With a Note on Laboratory Findings by

S. C. DYKE, D.M. OXF., M.R.C.P. LOND.

ACTINOMYCOSIS of the appendix is comparatively rare, and recovery from it is even rarer. The following case is therefore of interest.

The patient, a single woman aged 65, was seen on the morning of July 18th, 1927, when she showed all the signs of acute appendicitis. She had had some pain the day before, but had been well enough to attend church in the evening. At operation on the afternoon of the 18th a perforated appendix, well shut off by omentum, was found; this was removed and the wound closed with one tube for drainage.

The patient did well for two weeks, when the temperature rose a little and the left leg became œdematous and slightly painful. The pyrexia continued and two days later a swelling could be felt in Douglas's pouch. She was seen by Mr. B. T. Rose, who opened the abdomen in the mid-line and evacuated a large pelvic abscess; the wound was partially closed, a large pack left in to control hæmorrhage, and a drainage-tube inserted. In the course of the next few days most of the wound broke down, leaving the intestines exposed and pus poured out in increasing volume. Ten days afterwards the liver became enlarged and tender, jaundice developed, and the fæces became clay-coloured; two days later there was a rigor with a temperature of 104° F.

On the 20th the patient was seen by Dr. S. C. Dyke, consulting pathologist to the Walsall General Hospital, who took blood for cultural and other examinations and specimens of the pus. Dr. Dyke reported that smears of the pus showed a streptothrix of the actinomycotic type, and advised treatment by large doses of potassium iodide and a vaccine. The administration of potassium iodide was at once commenced in doses of grs. 20 three times daily, and a stock vaccine of the actinomycotic streptothrix was obtained from Messrs. Parke, Davis and Co.

For the following five weeks the patient ran a high swinging temperature with occasional rigors and pus continued to pour from the wound. The dose of potassium iodide was gradually raised until by the middle of September the patient was taking grs. 35 three times daily. About this time the wound commenced to close in, and by the second week in October had healed sufficiently for the patient to be removed from the nursing home to her own house. At this stage there was a long sinus running down into the left side of the pelvis from which pus was still discharging profusely; the original appendicectomy wound had by this time healed completely. The liver remained enlarged and tender, but the jaundice had disappeared; the œdema had subsided in the left leg, but had reappeared in the right; the mental condition had deteriorated and the patient was depressed, suffered from failure of memory, and from time to time from delusions.

The wound continued to close, and the discharge to become less; the temperature settled, but the patient developed intermittent attacks of pain in the right hypochondrium with dullness and tubular breathing at the right base accompanied by some dry cough. She became more and more listless and apathetic, took no interest in anyone or anything, and completely lost her memory for recent events. Early in November it was decided on account of the mental state to discontinue the potassium iodide, and at the request of the relatives the vaccine was also dropped. The mental condition at once began to improve, and by the end of the month she had regained sufficient interest in life to start reading the newspaper again; the improvement was maintained, and by January the patient was able to get out of bed. By March the general condition was good, but the patient still had a discharging sinus requiring dressing at least twice daily. Another short course of the vaccine was given, and the potassium iodide was restarted in doses of grs. 10 three times daily, but the patient refused to go on taking the drug as it made her so depressed.

The healing of the sinus continued, and it now discharges only an occasional bead of pus. The abdomen now presents no abnormalities other than some herniation through the scar of the second operation, which is controlled by a belt; the lungs are clear and the patient is leading the same sort of life as before the operation.

Note on Laboratory Findings by DR. DYKE.

Blood culture taken on July 20th gave no growth after 72 hours' incubation. The blood gave a negative direct van den Bergh reaction, and a slight positive indirect. Urine showed no bile salts, pigment, or urobilin. Films of the pus from the second operation wound showed numerous coliform bacilli and a few streptothricial threads. On the strength of this finding a larger supply of pus was asked for, and several cubic centimetres were forwarded by Dr. Sinclair on the following day. This pus showed numerous filaments and some dense clumps of streptothrix. The threads were Gram-positive, but failed to take the fuchsin when stained by the Ziehl-Neelsen method. Cultures were made on ordinary nutrient agar, on glucose and glycerine agar, and into plain and glucose broth, and were incubated both aerobically and anaerobically; but no growth of the streptothrix could be obtained. Pus was inoculated subcutaneously into the back of one mouse and intraperitoneally into a second one; both animals survived until killed six weeks later, when neither showed any sign of disease.

Walsall.

THE WOLVERHAMPTON HOSPITALS.—The Counsellors of State, on behalf of the King, have given authority to the Wolverhampton amalgamated hospitals to be called "The Royal Hospital." The institutions recently amalgamated are the Wolverhampton and Staffordshire Hospital, the Wolverhampton and District Hospital for Women, and the District Nursing Association and Maternity Home.

EDINBURGH ROYAL INFIRMARY.—The annual report of this institution shows that during the financial year 18,779 patients were admitted, which with 901 patients in the infirmary at its opening makes a total of 19,680 treated—an increase of 967 over the previous year. Of the cases admitted Edinburgh furnished 8815 and the country 9964. Out-patients to the number of 62,085 (most of whom attended several times) received medical and surgical aid. At the Convalescent House the total number of patients admitted was 1612. The report states that on August 6th the institution will have completed 200 years of beneficent work.

At a recent meeting of the managers the retirement of Dr. William Fordyce from the charge of a gynæcological ward was intimated. The managers, in recognition of his valuable work in the infirmary, unanimously invited his acceptance of the position of consulting gynæcologist. Dr. Fordyce has acted as a member of the honorary staff for 22 years. He was appointed assistant gynæcologist in 1906 and gynæcologist in 1921. Warm appreciation of his loyal services to the institution was recorded.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

A PATHOLOGICAL meeting of this Section was held on Jan. 2nd, Prof. GEORGE GASK presiding.

Sir LENTHAL CHEATLE gave a demonstration of transillumination as an aid to the diagnosis of breast diseases, a method which he was first made aware of by having it demonstrated to him by Dr. Max Cutler, in New York. (See THE LANCET, 1928, i., 38.) The method was very simple, and he regarded it as of distinct value.

Sir LENTHAL CHEATLE also made a communication on

Sterilisation of Surgical Drums.

He criticised the drum most commonly in use at the large hospitals, stigmatising it as one of the most septic things imaginable. He did not think any bacteriologist would trust a result which was founded on such so-called sterilisation as was applied in a typical drum shown on the screen. Steam, he said, was used under a pressure of two atmospheres, and certainly sterilisation of everything in it was attained; but air also had to be admitted, and, though cotton-wool was used, the portals of entry for the air were so large, and the passage of steam took place at such a great pace, that sterilisation in the end was not by any means complete. Any dressings exposed to this process, however thoroughly sterilised at first, were rendered septic again by the passage of air and its contents. He understood that the makers had never thought of testing the efficacy of the machine bacteriologically. His purpose in making the communication was to warn surgeons as to the possible fallacy of claims made for drums. Sometimes the drums were put into the sterilising apparatus open, sometimes closed, but even when closed the air openings were not closed; and air entering the machine for drying purposes was the vehicle for reinfection. The holes, moreover, were large enough to admit humming birds, humble bees, and grasshoppers; even maggots had been discovered in drums. The speaker had been experimenting with the object of evolving a more efficient sterilising drum, and his final result, which he demonstrated, was a tin having two grooves. Cotton-wool put in the two grooves and the lid on top kept the contents sterile until they were required for use. The difficulty was how to get steam into the drum to carry out the sterilisation; this difficulty was obviated by evacuating the steam and the air three times during the process, the sterilisation occupying two hours. When this method was employed efficiently the dressings, aprons, masks came out sterile and dry. With the apparatus now in general use he did not think the results were any better than after the ordinary wash.

The CHAIRMAN said the communication caused him to feel a little disturbed, because when, as a student, he was attending the bacteriology class, one of the duties was to examine the drums with the big holes, as described, and students were taught to believe that what came out of them was sterile.

Mr. DUNCAN FITZWILLIAMS said that if one bought from a store a roll of ordinary gauze, and removed the first three layers, the remainder of the roll would be found to have come from the manufacturer sterile. He referred to a war experience in Roumania in the matter of improvisation, and spoke of Dr. Cathcart's use of sterile sawdust as a cheap dressing, the centre pith of the wood being torn out and dropped into a pit, always being found strictly sterile.

Mr. FITZWILLIAMS showed a series of patients on whom he had carried out, at various dates,

Partial Removal of Breast for Early Carcinoma.

He said that probably the breast was the only site in the body in which a truly radical operation was carried out—i.e., in which the growth, the lymph field, and the whole area surrounding it. In cancer of the tongue the operator was not nearly so radical, being content with removing a portion of the tongue and the neck glands. In the rectum, too, though this was a danger area, the operation usually done was less sweeping than that in the breast. For breast carcinoma Halstead had recommended that the glands above the clavicle should be removed, because they were in the lymph field. Many surgeons, however, now left them untouched. The speaker suggested to his colleagues that in early cases of breast carcinoma much more could safely be left behind than was usual. The earliest case on which he had operated in this partial way was seen by him 23 years ago, and the patient was still alive; he had had 20 cases with a survival of one and a half to two years so far; while that evening he showed patients who were operated upon five, three, and two years ago. The theory on which he worked was as follows. Cancer was recognised to be, when it started, a local disease—when it was the size of a millet seed. At that stage, he contended, it was successfully removable by a purely local operation; it was so small that it was related to only the finest radicals and lymphatics. If left longer it ate into larger lymphatics, and so glands in the neighbourhood were involved. The difficulty lay in knowing just when it was so strictly local. His own working definition of "early carcinoma" was carcinoma without a single distinguishing malignant attribute. Years ago the teachers at Johns Hopkins school said that the presence of one malignant characteristic in diseases of the breast reduced the surgeon's chance of success by 25 per cent.; while if there were two malignant characteristics the chance was reduced by a further 25 per cent. That Mr. Fitzwilliams held to be true. When a tiny nodule of the breast was discovered the examiner had no right to tell the woman it was "nothing"; it ought to be removed forthwith. He remembered one case in which he could not satisfy himself that there was a lump; but in six months the woman came back with a flaring carcinoma. In a very early case sections would show several doubtful slides, and only one which could be called carcinomatous. He contended that a very early case of carcinoma of the breast could be cured by merely doing this partial operation. He was sure many cancer cells were destroyed by natural processes. The first gland to be infected would be blocked, and so very little or no lymph would pass through; hence this gland, at this stage, would not infect other glands. Until one knew a gland was infected there was no reason why it should be removed. In 30 cases he had seen no reason to regret having done only the partial operation.

When, at a distinctly later stage, infected lymph was flowing elsewhere and nodules were present at different sites, however radical the operation, it would be of little avail. In the smaller operation one did not find secondary growths all round the wound, as in the case of the larger surgical procedures.

The CHAIRMAN said a partial operation of such limited extent was contrary to surgical teaching, though it was probably supported by a partial truth. It was, however, preached by his chiefs a long time ago. His own immediate chief sometimes did only a small operation on the breast, occasionally taking away glands also, but sometimes not. And other surgeons, whose opinions he valued, had also done the small operation and shown good results. His, the speaker's, own trouble was in knowing when there was present only a small local growth. In some of the cases of carcinoma of the breast which he had regarded as very early, he found metastatic growths occurring quickly afterwards. If a growth could be caught before dissemination and destroyed by means of the cautery, or radium, or other method, a cure would probably ensue. But how was one to know

that a case had only reached that stage? Mr. Fitzwilliams instanced in comparison tongue cancer, but in that organ the results were bad.

Sir LENTHAL CHEATLE said he agreed that if a case were met with early enough, local excision would probably suffice. But there must be malignant disease in the terminal ducts and acini before any of the cells got out. His own view was that to adopt the method of local removal was a retrograde step. He remembered several cases in his career, and in the career of other surgeons, in which the axillary glands were enormous and yet it was very difficult to detect even a small primary nodule in the breast. In a series of cases he examined the vessels and tissues round the axillary vein before doing the complete operation, and in only one was that area free from carcinoma.

Dr. D. F. CAPELL asked whether, as it was often impossible to find changes in the breast apart from the local area, there was not a risk of further development of carcinoma from some of these other foci. He had examined a series of such cases and had found changes bordering on cancer in multiple foci. When only a small part of the breast was removed, was not one leaving behind an area which might later become malignant?

Mr. FITZWILLIAMS, in reply, said the points raised concerned a wider area than he had opened up. The idea of merely local removal was not new. The crux of the matter was, if it was felt that removal of half or three-fourths of the tongue sufficed for cancer of that body, why should not a like local removal be enough in very early breast carcinoma? In the early cases he was speaking of there were no enlarged glands in the axilla, nor was there a single malignant characteristic present. If there were such signs a larger operation must, of course, be done. In precancerous leucoplakia of the tongue it was not the practice to remove the tongue.

Prof. C. A. PANNETT submitted a communication on

The Use of the Cautery in Operations on the Stomach.

He explained that he was not referring to the cauterising of ulcers. The problem was the following. Often a patient with gastric disease was thin, emaciated, half-starved, and so was not in a fit condition to undergo a severe abdominal operation. Hence the conservation of every possible drop of blood became a prime consideration. The generally employed methods of performing gastrectomy did not always meet the situation in this respect. It was easy to tie off the lesser omentum and the greater omentum and to proceed, bloodlessly, to a stage at which the actual growth or ulcerous area must be excised. But in the case of a large gastrectomy for high gastric ulcer or carcinoma he had frequently found it impossible to use the ordinary hæmostatic clamps to control hæmorrhages while cutting the viscus across. He had been using a simple procedure for working without hæmostatic clamps. In some clinics, faced with the same situation, the Paquelin cautery had been used, but this was a clumsy method of dividing the stump, and it burned a wide area of the viscus and led to a wide cicatricial band. He had never seen anybody divide viscera with the ordinary Paquelin cautery. When using the cautery for dividing the stomach, two things were necessary. First, one must minimise the amount of heat required, which was done by temporarily controlling the circulation, which would otherwise act as a cooling stream. Secondly, the clamp used must be massive enough to conduct away the heat, so that the tissue around the clamp was not burned. He used two forceps, one of them fenestrated. He described the details of his procedure by means of illustrations on the epidiascope. The adoption of this procedure, he said, had enabled him to operate on people on whom he would not otherwise have ventured. One patient who dealt with died subsequently from a pulmonary trouble and there was found to be no difference in the operation site as compared with the ordinary hæmostatic cautery suture.

Specimens and Cases.

Mr. C. P. G. WAKELEY showed two specimens. The first was one of cavernous angioma of the brain, from a woman aged 25 who came to hospital because of the weakness of the left arm and left leg. Beyond some excitement, nothing pointed to a cerebral lesion. Post mortem, œdema was seen round the angioma in the brain, and it had led to secondary hydrocephalus. The other case was a meningeal myxoma. The man, aged 48, had had fits and some paralysis of the leg. X rays were of great help in locating the tumour. An osteoplastic flap was turned down, and as soon as the dura mater was exposed the growth bulged into the wound, and on incising the dura the tumour spontaneously presented. Shortly after the operation some paralysis of the leg occurred, but that soon cleared up, and the patient got quite well.

Prof. PANNETT praised the surgery carried out in this case.

Mr. GWYNNE WILLIAMS showed a patient on whom he had carried out partial exclusion of the thoracic aorta for the cure of pain. The man had had aneurysm of the abdominal aorta five years, and came to him for the relief of his pain. Mr. Williams reduced the pulse in the femoral in the groin by pressure, and pain had now practically ceased. He could not put a wire in as the aneurysm was too extensive.

Other cases were also shown.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

A MEETING of this Section was held on Jan. 8th with Dr. H. H. DALE in the chair. An informal discussion on the treatment of

ESTABLISHED DIABETIC COMA

was opened by Prof. E. C. DODDS, who pointed out that the subject allotted limited the discussion to methods of bringing a comatose patient back to consciousness. At the Middlesex Hospital they relied for the insulin dosage on blood-sugar estimations. The blood-sugar estimation took about 15 minutes and then the first dose of insulin was given, usually about 100 units; thereafter the blood-sugar was watched and the dosage adjusted accordingly until the patient recovered. It was possible to work with urine-sugar estimations up to a certain point—about the time when the patient began to lose his air-hunger—but thereafter grave risk was run if blood-sugar estimations were not made. He disagreed with those who regarded it as waste of time to administer glucose; apart from the benefit to metabolism, glucose acted as a barrier against hypoglycæmia. The alkali reserve was worth determining, for it revealed more than did the blood-sugar estimation or the simple tests for acetone bodies in the urine. The majority of patients treated in this way recovered, but a certain number died. For these deaths three reasons had been put forward: (1) Inability to control the diabetes so that hyperglycæmia and ketosis continued. This occurred chiefly in septic cases and therefore did not come into the present discussion. (2) Kidney damage, leading to retention of urea and a uræmic coma very like diabetic coma. Investigation of a series of cases had shown, however, that high urea and non-protein nitrogen content in the blood was not unusual in diabetic patients, and that it occurred in those who recovered from coma as much as in those who died. (3) Failure of the circulatory system. Two patients at the Middlesex who had died in coma had had low blood pressure and had appeared to die of circulatory failure. The total acetone bodies in their bloods had been below normal, about 3·5 mg. per 100 c.cm.; in one case the blood had been taken just as the patient died. The blood pressure was of great prognostic importance. In these two cases the subcutaneous administration of ephetonin and pituitrin had failed to save the patients' lives.

An Instructive Case.

Dr. GEORGE GRAHAM said that all his patients had either recovered or had first been treated very late. Four weeks ago, however, he had had a case which might be instructive.

The patient was a boy of 16 who had been doing well on diet and insulin for six years and had entered for an examination. He had felt ill and done his papers badly, and had gone to bed without either food or insulin. At 12.30 A.M. he had vomited. At 3.30 A.M., when his mother had seen him, he had been obviously ill, and she had supposed him to be suffering from hypoglycæmia and had given him adrenalin and sugar. When the doctor had seen him at 6.30 A.M. he had been dazed and had complained of pain in the right side of the abdomen, for which morphia had been given. He had then had more sugar and travelled 30 miles to hospital by car. On arrival he had been very cold with a pulse-rate of 120, a blood-sugar of over 700 mg., and a white blood cell count of 32,000; 100 units of insulin had then been given. The possibility of a gangrenous appendix had led to a laparotomy—the first error in treatment, for nothing abnormal had been found. At 4 P.M. the blood-sugar had again been over 700 mg. and 50 g. of dextrose and 150 units of insulin had been given. He had smelt strongly of acetone, and the blood had flowed sluggishly when withdrawn for testing. He had therefore been ordered saline infused by gravity, the dextrose and insulin doses being continued. At 10 A.M. the next morning a blood count had shown 5,800,000 red cells, 6000 white cells, and a hæmoglobin percentage of 108. The blood-sugar had dropped to 240 mg. At 11.30 he had received another 100 units of insulin by mistake, and the next 24 hours had been occupied in keeping him out of hypoglycæmia by the administration of sugar per rectum and per os. At 11 P.M. the blood-sugar had risen to 170 mg. but at 3 A.M. the patient had become pale and rigid, being restored to normal by the administration of adrenalin and dextrose. At 8 o'clock next morning the blood-sugar had been 40 mg. and adrenalin had been repeated, followed by 10 units of pituitrin and dextrose intravenously. Next morning he had been better, with a blood-sugar of 370 mg.

The urine of this patient had contained granular casts and pus cells but no red cells, and not until the sixth day had acetone bodies appeared in it; then the reaction had been very strong until, on the fourteenth day, there had again been no acetone in the urine. The boy had gone into coma because he had had something wrong with his kidneys and they had been unable to excrete acetone bodies. Treatment of diabetic coma must be by the administration of plenty of insulin and plenty of sugar; it was a mistake to give insulin without waiting for the blood-sugar estimation. Further, fluid should be given intravenously; one patient who had died of circulatory failure had had a hæmoglobin percentage of 140 per cent. These patients died from a condition akin to surgical shock; they could not keep fluid in their blood. Therefore fluid must be given them, if necessary under pressure. There was often some vein spasm which prevented the entrance of fluid under gravity.

The Administration of Glucose and Alkalis.

Dr. R. D. LAWRENCE said that he had not had many cases of diabetic coma, as the pre-comatose patient usually recovered with insulin and glucose. He agreed that the patient was dehydrated, as judged by the tension of the eye, and should at once receive large quantities of intravenous saline. With this, where the pulse was collapsed, should be given a drop or two of adrenalin. Difficulty in getting the fluid in could be overcome by the use of a blood transfusion syringe. Strophanthin might be given for the heart, but the effect of adrenalin alone was often miraculous. It lasted for 20 to 40 minutes. The whole problem was one of circulatory depression, and the failure of the kidney to excrete acetone bodies had nothing to do with the severe condition of the patient. He did not agree, however, that glucose should always be given; its administration was unnecessary and unphysiological. When the blood-sugar could be watched sugar should not be given at the outset, but for the patient outside hospital it was essential from the first, as it was impossible to tell how quickly a patient would respond to the insulin. Improvement usually coincided with lowering of the blood-sugar, but the patient might just as well recover with a high blood-sugar. The old overdosage with alkalis was now discarded, but it was wise to give small doses of sodium bicarbonate in the early stages. He detailed a case illustrating the very prolonged effect insulin might have once it got going. In this patient it had required large doses of insulin to get the blood-sugar down in the first 12 hours, and it would never have come down if glucose had been given as well.

Prof. HUGH MACLEAN said that everybody was agreed on the general treatment of these cases and that large doses of insulin should be given. At his hospital it was the custom to give 50 units before the blood estimation and thereafter to regulate the dose by the blood-sugar. He agreed that when the blood-sugar could be watched it was unnecessary and unphysiological to give large amounts of glucose. There was no doubt of the efficacy of cardiac stimulation, and camphor might have a marked effect in some cases. It must be remembered that a high blood-sugar in itself did no harm so long as there was no acidosis, and that it did not really matter whether the blood-sugar were lowered or not. The principles of treatment must be directed towards supplying large amounts of insulin and moderate amounts of blood-sugar. It was possible for a patient to be suffering simultaneously from diabetic coma and insulin hypoglycæmia, and a fall in blood-sugar did not necessarily indicate the passing of coma. A patient with a blood-sugar of 0·01 or 0·02 might pass huge quantities of ketone bodies in his urine and be in coma. For the general practitioner who could not obtain blood-sugar estimations the problem might be a very difficult one, and under these circumstances plenty of glucose should be given, after the initial dose of insulin. The effect of diabetic coma on the circulatory system was very severe, and grave additional risks were run if the blood-sugar were allowed to get so low that insulin hypoglycæmia might supervene, for this in itself was very detrimental to the cardiac mechanism. In angina patients the brief periods of hypoglycæmia following administration of insulin might precipitate an anginoid attack and cause death. It was bad to give large amounts of bicarbonate; it had been shown that the administration of sugar after a period of fasting would fail to stop the ketonuria if a dose of bicarbonate were given previously. Small doses, however, were indicated because of the low alkali reserve and the depletion of the alkalis of the body.

Dr. O. F. LEYTON said that he had not been convinced that sugar was harmful. Sugar could not dehydrate the patient if plenty of water were given with it. In his experience patients with a low renal threshold might develop diabetes mellitus, and even if this were not admitted, the renal threshold was not constant and might fall very low indeed in diabetic coma and hypoglycæmia. It was therefore dangerous to conclude that because there was sugar in the urine more insulin might be given.

The Time Factor and the Age Factor.

Dr. P. J. CAMMIDGE said that error was bound to occur if it were assumed that all diabetic coma was one and the same thing. The treatment depended greatly on the time that coma had existed and on the age of the patient. Diabetic coma had first been ascribed to acidosis, then to changes in the hydrogen ion concentration of the blood, and now it was believed to be due to changes in the osmotic pressure in the cells and between the cells and the plasma: depletion of the fixed bases from the nerve cells led to unconsciousness, and from the heart to weakness, fall of blood pressure, &c. In the early stages patients would recover rapidly if the acetone and other bodies which were combined with the fixed bases could be removed. Fairly large doses of insulin intravenously were all that would be required. Other patients, who had been unconscious for some time, would not be affected by any amount of insulin. The patient who recovered easily was usually young. The elder

patient as a rule needed sugar as well as insulin, and even then the rate of oxidation of the ketone bodies could not always be speeded up beyond a certain limit. The only way then was to give alkalies intravenously in small amounts, along with the insulin and glucose.

Dr. W. W. PAYNE emphasised the fallacy of testing the urine alone. He quoted a case where the urine had shown no sugar or acetone bodies and the blood-sugar had been 0·5, but the patient had died in uræmic coma with a blood-urea of 250 mg. Another patient had been in coma for two days; on the first day he had had acetone bodies in the urine but they had been absent on the second day, although there was no lack of them in the system.

The Significance of Chlorides and Phosphates.

Dr. C. G. WOLF mentioned the work of Prof. L. Blum and his colleagues at Strassburg on the depletion of chlorides in the body in diabetic coma. They thought that part of this condition was due to the very low chloride content of the body. The addition of sodium chloride to the insulin seemed to have a good effect, one that was not produced by any other sodium salt.

Dr. PHILIP HAMILL pointed out that it was dangerous to give repeated doses of morphia subcutaneously for cholera because the drug might remain in the skin while the circulation was poor and be taken up again when the administration of saline had improved the state of the blood. He suggested that the same fate might befall subcutaneous insulin when the patient was dehydrated.

Dr. F. B. BYROM referred to his work on the phosphate-content of the blood. In three fatal cases of diabetic coma he had found the phosphate-content extremely high, a condition only found in uræmia. This suggested that renal drainage played a large part in patients with diabetic coma who arrived late at hospital.

Dr. G. C. LINDER described a patient with diabetic coma who had come into hospital with 400 mg. of blood-sugar and a carbon dioxide concentration of 8 volumes per cent. in the whole blood. He had been given 10 g. of bicarbonate intravenously, which had only raised the carbon dioxide to 17 volumes per cent., although the hyperpnœa had disappeared and the patient improved. Another 15 g. of bicarbonate had brought the carbon dioxide content to 39 volumes per cent. without any evidence of overdosage. This showed that large doses of alkali could be given, provided their effects were followed by determinations of the carbon dioxide in the blood. The patient had been under a tremendous handicap owing to his very low alkali reserve.

The CHAIRMAN said that the suggestion made by Dr. Hamill had occurred to him, and he thought it might be wise to begin by administering a small dose of insulin intravenously rather than a large one subcutaneously. If a rabbit were given insulin hypodermically it would suffer from hypoglycæmia in half an hour. It could be brought round from this state, but its troubles were not then over, for in another hour it would be down again. It had to be treated repeatedly for several hours. In cholera hypertonic saline had been found preferable to normal saline, and it might also be better for the diabetic.

Dr. CAMMIDGE pointed out that Joslin in pre-insulin days had strongly favoured the administration of sodium chloride to patients with acidosis, because it kept the ketone bodies locked up in the tissues, so preventing them from circulating and doing damage.

Dr. GRAHAM, replying for himself and Prof. Dodds, said that he had simply given saline because the blood was sticky. Prof. Dodds agreed that the saline should be hypertonic and thought that it would be wrong to leave out sugar as a general rule because of the danger of passing too quickly from hyper- to hypoglycæmia.

Dr. LAWRENCE remarked that insulin did not act particularly in the blood, and that its action was usually protracted. The continued effect of large doses could easily be explained without assuming a delay in the skin. He had tried intravenous injection in a case where subcutaneous administration had failed, but without effect.

Dr. CAMMIDGE said he always began with a small intravenous dose of insulin, taking some blood away for testing at the same time, and went on giving small doses until a definite effect was obtained. It was possible to carry out sugar estimations at the bedside by the picric acid method, and to obtain comparable results.

WAR SECTION.

AT a meeting of this Section on Dec. 10th, with Lieut.-General Sir MATTHEW FELL, the President, in the chair, a paper on

Some Common Problems in Naval Hygiene

was read by Surg.-Commander P. M. RIVAZ. From what he said it appears that ventilation by punkah-louvres, which direct the entering air to the point where it is desired, are highly successful in the Navy, and exhaustion of air is serviceable in galleys, lavatories, and engine-rooms, though not in cabins or mess-decks. Constant vigilance by ventilation committees is needed to keep the supply of air working well. Fans must be rested, in cabins and mess-decks by day, in offices by night. Current opinion is in favour of more table fans. Clothing must be very light in the tropics; officers are apt to be too much clothed. If stokers working on coal fires wear too little they get scorched; if too much they get heat-stroke. Deficiency diseases and diets suitable for the tropics are under investigation. It is hardly possible, Surg.-Commander Rivaz considers, to compare the prevalence of tuberculosis in the Services with its prevalence in civil life, where notification is still very uncertain. Every man under 36 in the Navy is weighed once a quarter, and all chests are examined every six months, but the early doubtful case is still a difficulty.

In the discussion following this paper Major-General H. P. W. BARROW said that ventilation and the reduction of overcrowding had been found of great importance in relation to troop transport by sea. With enlarged cubic space, better spacing of hammocks, hospital admissions in troopships had gone down from 631 in 1914 to 277 in 1926. Experiments on vitamins and diet were to be undertaken in the East and much was hoped from them, also from the forthcoming report of the Joint Committee on Tuberculosis.—Fleet-Surgeon W. E. HOME said that overcrowding had been defined by Sir Thomas Fraser as a function of the number of persons occupying a space and the efficiency of the ventilation of that space. He (the speaker) had seen men with only 100 cubic feet of space develop illness from overcrowding in a month.

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

A MEETING of this Society was held at St. Bartholomew's Hospital, London, on Jan. 4th and 5th, with Prof. E. H. KETTLE in the chair.

J. W. McNee (London) discussed the pathological classification of chronic splenomegalies met with in Britain and drew special attention to the common type starting with hæmorrhage round the ellipsoids with subsequent fibrosis and siderosis, the actual gross enlargement being due to venous obstruction. He regarded true Banti's disease as very rare.—J. M. Ross (London) exhibited a specimen of the rare form of splenic enlargement due to overgrowth of the Malpighian bodies (Foix and Roemmele type).—J. S. Young (Leeds) found that salts injected into the pleura stimulated hyperplasia of the alveolar epithelium in proportion to the valency of the kation. The cells are refractory to a second dose.—I. Berenblum (Leeds) obtained a few epithelial tumours in mice by repeatedly freezing the skin with CO_2 snow. Freezing did not increase the carcinogenic efficacy of tar which is actually diminished by mustard gas.—

H. J. B. Fry (London) discussed the incidence of positive Wassermann reactions in patients with malignant disease; those with buccal cancer gave a much higher proportion of positives than the rest, but on the whole syphilis appeared to have little relation to malignancy.—J. R. Perdrau (London) discussed the acute disseminated encephalomyelitis associated with vaccinia and other infections; he thought that the perivascular demyelination was probably due to a toxin. An example of the condition following measles was described by J. G. Greenfield (London).—D. F. Cappell (Glasgow) had found that sugar of iron injected intravenously was quickly taken up by endothelium, after a few days liberated into the blood in a recognisable form and thence taken up again by the histiocytes of connective tissue, lymph glands, kidney, and liver in which it remained (in mice) for many months.—R. D. Passey, G. M. Bonser, and M. J. Stewart (Leeds) from a study of human and animal melanomata concluded that the melanin was made by the tumour cells but that the great majority of cells in which it was found were large mononuclear phagocytes.—C. Price-Jones (London) has measured 500 red blood corpuscles in each of 100 normal adults; the smallest mean diameter was 66μ, the largest 7·49, the average 7·198. The excess of large cells in pernicious anæmia could be calculated from these standards.—F. Parkes Weber (London) described a case of generalised osteosclerosis with severe anæmia.—W. W. C. Topley, M. Greenwood, J. Wilson, and E. Newbold (London) showed how the efficacy of experimental vaccinations could be elegantly tested by exposing the inoculated animals with their controls to an epidemic established in a mouse colony, and gave some of the results they had obtained with *Bacillus aertrycke*.—F. C. Happold (Leeds) described his observations on the group relationships of Salmonella precipitinogens and the influence of cultural variations.—A. Felix and M. Rhodes (London) and R. M. Pitt (London) discussed various aspects of bacterial dissociation, and P. B. White (London) gave an account of some pitfalls in the agglutination of rough strains and showed a differential test for smooth and rough bacilli.—A. S. Strachan (Johannesburg) compared his post-mortem experiences in South Africa and Glasgow. Atheromatosis is very common in whites and natives, and calcification of the mitral value is the rule over middle age; high altitude, excessive exercise, and much sunlight might be causes. Arteriosclerosis is not more frequent than in Britain. Natives show a great excess of primary carcinoma of liver, not associated with bilharzia; tuberculosis of heart, pericardium, and spleen are relatively common, also hæmochromatosis. Lymphatic tubercle often resembles lymphadenoma.—A. Fleming (London) concluded that the bactericidal power of blood on pneumococci was due to the combined action of leucocytes and serum, but that phagocytosis was not a necessary part of the process.—G. H. Eagles and D. McClean (London) described the cultivation of vaccinia virus in tissue cultures of chicken embryo.—C. H. Andrewes (London) found that immune vaccinia serum had no effect on the lesion at the site of inoculation but prevented subsequent generalisation. Virus fixed to tissue cells was unaffected by serum.—J. B. Buxton (Cambridge) had reproduced caseous lymphadenitis in sheep by inoculation or feeding with the Preisz-Nocard bacillus.—R. E. Glover (Cambridge) confirmed the finding that contagious pustular dermatitis of sheep is due to a virus, filtrable with some difficulty, which withstands drying well. No inclusive bodies were found in the lesions. The disease occurs mostly in fat lambs in the summer and affects no other animals except goats—T. Dalling (London) showed that vaccination of ewes with formalised bacilli of the special type of *Bacillus welchii* prevented lamb dysentery as well as toxin-antitoxin mixtures; resistance is transferred from ewe to lamb through the colostrum.—S. Ellingworth, J. W. McLeod, and J. Gordon (Leeds) gave an account of the oxidation of dyes of the paraphenylenediamine series by various bacteria and pointed out the value of the production of Wurster's violet in diagnosis.—J. H. Dible and C. Weatherall (Cardiff) found that enterococci nearly always fermented æsculin; they give hæmolysis only on blood-agar, not in broth.—R. Ellis and C. H. Whittle (Cambridge) described an apparent epidemic of pneumonia in a country village.—D. Nabarro (London) urged that the frequent occurrence of real bacillary dysentery (Sonne, Flexner, parashiga, and Shiga) in Britain, especially in children, should be more widely recognised.—V. D. Allison and T. H. Ayling (London) described a new tellurite-copper-sulphate medium for the isolation of diphtheria bacilli.—H. W. Crowe (London) claimed that certain streptococci could be shown to have a selective affinity for bone.—Among the exhibits were: M. J. Stewart and A. C. Haddow (Leeds): "peculiar bodies" of pulmonary asbestosis obtained by lung puncture. H. J. B. Fry (London): three cases of chordoma. D. Nabarro (London): congenital syphilis with enlarged thymus and lymphoid hypertrophy. D. F. Cappell (Glasgow): myeloma (*a*) plasma celled, (*b*) type with tumour nodules and visceral lesions. M. J. Stewart and S. J. Hartfall (Leeds): chronic peptic ulcer at lower end of œsophagus. G. S. Williamson, I. H. Pearse, and R. McCarrison (London): experimental and spontaneous lymphadenoid goitre.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society held on Jan. 3rd, with Mr. GEOFFREY BATE, the President, in the chair, a paper on

Chronic Appendicitis and Conditions which Simulate It

was read by Mr. H. N. FLETCHER. In describing the various forms of pathological appendix seen at operation he referred to a not very common variety usually seen in children, in which there was very marked hypertrophy of the adenoid tissue of the mucosa and large fleshy succulent glands of the ileo-colic mesentery. Colicky pains of short duration, coming on especially after food, were the principal symptom. They appeared to be due to spasm set up by the hypertrophied mucosa, which did not necessarily show any histological evidence of inflammation. The enlarged glands might cause slight tenderness over them. It seemed probable that their enlargement was due to absorption of toxins from the appendix. There was no apparent enlargement of glands elsewhere, nor of the tonsils. In diagnosis of chronic appendicitis Mr. Fletcher supported the emphasis laid by J. Sherren and others on the importance of a history of a preceding acute attack, starting centrally; and of viewing with suspicion any case in which the pain had started in, or had been confined to, the right iliac fossa. None the less there were exceptions. He had operated on not a few patients with acute appendicitis who insisted that the pain had started in the right iliac fossa, and this was especially the case when the appendix lay in an extra- or retro-cæcal position. Again, there were cases of undoubted chronic appendicitis where there had been no acute attack, notably of the type in which a fæcal calculus caused a mild inflammation of the mucosa surrounding it. Cases not conforming to Sherren's rule should be scrutinised with the greatest care and every other possible cause canvassed in turn, with the help, if necessary, of X rays, and always with a routine microscopic examination of the urine. No history and examination was complete which did not include in its survey the urinary, generative, digestive, and biliary systems.

The speaker reviewed 100 cases in which he had operated for supposed chronic appendicitis, and in all of which at least one year or more had elapsed before

inquiry was made. Sixty-eight, or just over two-thirds, had been cured of the pain for which they sought relief. Thirty-two patients had had some return of pain or some minor disturbances which precluded them from being regarded as definite cures. Errors of diagnosis, the majority being cases of tuberculous glands, accounted for 12 of these failures. Sixteen patients, five of whom had undoubted appendicitis also, had ptosis of, or congenital membrane formation in, the proximal colon, which was probably the cause of their renewed pain. It was significant that of these 16 patients 15 were females of whom 11 were young adults. Twenty-nine patients with true appendicitis had dyspepsia also. Of these, 22 were cured by appendicectomy. Twelve had the flatulent and 17 the painful type of dyspepsia. Of these latter, there was in eight cases a strong mimicry of gastric or duodenal ulcer in that the pain was of a severe gnawing, cramping, or gripping type, constant in its time incidence after food, the attacks lasting one, two, or more weeks, with periods of complete relief between. Six of these patients were entirely cured by removal of the appendix. The concurrence of attacks of dyspepsia and the lighting up of appendicular symptoms was noted in several cases.

Mr. Fletcher discussed the differential diagnosis between chronic appendicitis, pelvic, urinary, glandular, and cholecystitic, and proximal colon diseases, paying special attention to the latter, which was the most common source of error in the female sex. In speaking of cutaneous hyperasthesia in appendicitis, he said he had found it far more frequently involving the neighbouring halves of the tenth and eleventh right dorsal segments than any other area, and though the cæcum might possibly also be represented in those segments, he regarded such hypersensitiveness as a valuable confirmatory sign of appendicitis.

INFLUENZA.

MEASURES FOR ITS PREVENTION.

A WIDESPREAD epidemic of influenza is reported from Canada and the United States, where it began in the west about the middle of October. Although mild in form it has caused a considerable increase in the general death-rate and at least a million people were infected before the end of last year. Some concern is felt, therefore, lest it should soon appear in this country, and though the latest published returns (see p. 102) show but little rise in the number of deaths ascribed to the disease, the advent of a serious epidemic within the next few weeks is by no means unlikely.

The Ministry of Health has therefore re-issued to local authorities its useful memorandum [1] on the subject. As a full abstract has already appeared in THE LANCET (1927, i., 248), we will now do no more than refer to some of the main recommendations made.

Attention is, of course, drawn to the need for efficient ventilation and to the dangers arising when many persons are aggregated in sleeping quarters where there is insufficient space between head and head. At the same time it is suggested that temporary overcrowding in trains, trams, omnibuses, and places of entertainment is probably a more important factor than home overcrowding in spreading infection.

"During influenza prevalence, those who are able to do so will diminish their chances of contracting the disease by keeping away from all places of public resort or social gatherings. Most persons are able to avoid at least some occasions of forming part of a crowd or assembly without prejudice to their necessary occupations, and should do so."

Apart from the use of good nourishing food, whose value is obvious in warding off respiratory disease, the measures considered include gargling of the throat and nose, the wearing of face-masks, and protection by vaccines. Gargling may be useful, and a satisfactory antiseptic for the purpose is thymol (e.g., one full tablespoonful of compound glycerine of thymol in a tumbler of hot water). A cheaper gargle, probably as effective, is dilute permanganate of potash (1 in 5000). On present knowledge it is not regarded as desirable to wear face-masks, though they may be occasionally needed by those attending the sick. There is presumptive evidence, says the memorandum, that something can be done by the use of vaccines of suitable composition to lessen the risk of the attack being complicated by secondary infections. Vaccines may suitably consist of killed emulsions of pneumococcus, streptococcus, or Pfeiffer's *Bacillus influenzæ* separately or in combination, and though such direct evidence as the Ministry has been able to collect does not encourage an optimistic view of their value, there exists testimony by individual observers to their good effect in some cases.

On the precautions to be taken when attacked the memorandum states:—

"Continuing at work after the first symptoms appear is bad for the patient, and may be dangerous to others. Workers obviously ill should at once be sent or taken home. Where influenza is prevalent, no person should in any way be penalised for staying away from work, bona fide, for even a slight attack of influenza or any form of feverish cold. On the contrary, he should be expected and required so to do.

"At the first feeling of illness or rise of temperature the patient should *go to bed, keep warm, and seek medical treatment.* . . . . Relapses and complications are much less likely to occur if the patient goes to bed at once and remains there till all fever has gone for two or three days; much harm may be done by getting about too early. Chill and over-exertion during convalescence are fruitful of evil consequences.

"The early stages of an attack are the most infectious, but infection may persist throughout the illness, and isolation should be maintained at least till the temperature is normal. If the patient cannot occupy a separate room the head of the bed should, if possible, be screened off from the rest of the apartment.

"The virus of influenza is easily destroyed, and extensive measures of disinfection are not called for. Expectoration should be received when possible in a suitable receptacle in which is a solution of chloride of lime or other disinfectant. Discarded handkerchiefs should be immediately placed in disinfectant or, if of paper, burnt.

"The liability of the immediate attendants to infection may be materially diminished by avoiding inhalation of the patient's breath, and particularly when he is coughing, sneezing, or talking. A handkerchief or other screen should be held before the mouth, and the head turned aside during coughing and sneezing. The risk of conveyance of infection by the fingers must be constantly guarded against, and the hands should be washed at once after contact with the patient or with mucus from the nose or throat."

The rest of the Ministry's memorandum is devoted to the action to be taken by sanitary authorities to combat outbreaks. It deals with the questions of education of the public and profession, notification, closure of schools and places of entertainment, ventilation of trains, 'buses, and trams, disinfection, organisation of medical and nursing services, and institutional treatment. It is thought that schools may sometimes be closed with advantage in rural and small urban districts where the children do not mix much out of schools hours.

[1] Memorandum on Influenza (revised edition). London: H.M. Stationery Office. Pp. 14. 2*d*.

LORD NINIAN HOSPITAL, CARDIFF.—This Roman Catholic Hospital was founded in 1918 by the Dowager Marchioness of Bute in memory of her son, Lord Ninian Crichton-Stuart, who fell in the War. The announcement of her intention to place the management in the hands of trustees has led to the resignation of the entire nursing staff, on the ground that "the institution cannot be run under trustees." The nurses are Sisters of the Order of the Sacred Heart, and they believe that the new arrangements would hamper their work. Lady Bute has now set aside a substantial sum for the endowment of the hospital in perpetuity.

Reviews and Notices of Books.

FUNGI AND FUNGOUS DISEASES.

The Adolph Gehrmann Lectures. By Prof. ALDO CASTELLANI, K.C.M.G. (Hon.), M.D., F.R.C.P., Professor, Tropical Medicine, Tulane University, New Orleans; Director, Tropical Medicine and Dermatology, Ross Institute, London. Chicago: American Medical Association. Illustrated. Pp. 203.

IN an introduction to this admirable series Prof. Castellani says that "20 per cent. of all tropical diseases are due to fungi, and . . . diseases due to fungi are also not at all rare in temperate climates." There is no doubt that fungous diseases, if not on the increase, are at least more frequently recognised, both clinically and in the laboratory, than they were a decade ago, and no small part of the credit for this advance is due to Castellani's researches on mycology. The science of mycology is older than that of bacteriology, but took second place after the stir created by the discoveries of Pasteur and Koch, and is almost entirely neglected in the medical curriculum at the present day. The average reader will be discouraged in his attempt to make a close study of a subject which has so difficult a nomenclature. Even the dermatologist will find the going hard, but to him, as also to the pathologist who takes an interest in the practical side and the cultural proof of mycotic disease, this collection of reprints from the *Archives of Dermatology and Syphilology* will be found most stimulating. The first lecture, which occupies no less than 103 pages of closely printed text, is given to the fungi, their morphology, methods of culture, and classification. The second lecture (44 pages) deals with certain diseases due to fungi, including those of the tonsils and bronchi, and mycotic invasion of the nervous system. Cutaneous affections due to fungi—and these, as every dermatologist has come to realise, are much more common than was hitherto suspected—render the remaining 55 pages the most interesting and important of the series. Particular attention should be paid to the sections which suggest a possible cause of ano-genital pruritus and eczema. It would appear from some of the case records that this distressing and intractable affection does not always present a typical clinical picture; and it may require repeated microscopic and cultural tests by a skilled mycologist to determine its true nature and institute proper treatment. The text of these lectures is crammed with data, and we feel some sympathy for the medical student of the future who, when the subject of mycology is once more established in the curriculum, will be expected to grasp its fundamentals in the same way as his predecessor must master the elements of bacteriology to-day.

There is no treatise on clinical mycology in the English language which will stand comparison with this admirable survey of the subject up to the year 1926, when the lectures which form its pages were delivered.

AN INDEX OF DIFFERENTIAL DIAGNOSIS OF MAIN SYMPTOMS.

Fourth edition. Edited by HERBERT FRENCH, M.D., F.R.C.P. Bristol: John Wright and Sons. 1928. Pp. 1171. 63*s*.

THIS book has been out of print now for over five years, the third edition having been reprinted for the last time in 1922. Its reappearance will be welcomed. The index is compiled on the assumption that a particular symptom attracts special notice in a given case, and that the diagnosis has to be established by differentiating between the various diseases to which this symptom may be due. Thus, supposing a patient consults a physician or surgeon and presents some noticeable and perhaps isolated symptom or sign, for which there is no obvious cause, various paragraphs in the book provide a full list of the possible causes and the differential diagnosis of each is freely discussed. The sections on vomiting, aphasia, and swelling in the right iliac fossa provide typical examples. All vomiting is either central or reflex in its physiological relation to the vomiting centre; as central causes we find drugs, tobacco, uræmia, diabetes; as reflex ones we find three groups, gastric, general visceral—e.g., peritonitis—and central nervous—e.g., meningitis. Aphasia will be found under a section devoted to defects of speech, which differentiates between difficulty due to mental defects, aphasia proper, deaf-mutism, and dysarthria. Swellings in the right iliac fossa are similarly set out and described in proper contrast. There is at the end of the book also a subsidiary index of great length, being, in fact, almost one-quarter of the size of the rest of the volume. In this subsidiary index there seems to be set forth every subject for diagnosis under every possible heading; we are not quite clear as to the functions that this additional compilation of 227 pages is designed to serve.

The volume is admirably illustrated, there being now 701 illustrations, of which 179 are fully coloured. Among the uncoloured ones X ray prints are abundant and excellent. There is a special short paragraph on X ray methods in the last section in the book, wherein lipiodol injections into the lungs and uterus and the new methods of skiagraphy of the gall-bladder are well described and illustrated. Of the coloured illustrations those of various throat conditions (tonsillitis, quinsy, and faucial diphtheria), of acute inflammatory conditions of the eye, of actinomycosis, and of the face in mitral stenosis are noteworthy. Contributions are made by 20 individuals, the lion's share of the work falling to the editor.

The fund of knowledge contained in this volume is incalculable, and at the same time it is easy and pleasant to read.

DIE CHIRURGIE.

Edited by Prof. M. KIRSCHNER and Prof. O. NORDMANN. Lieferung 19. *Die Vorbehandlung, der Verband und die Nachbehandlung bei chirurgischen Eingriffen.* By Prof. O. NORDMANN. *Die plastischen Operationen der Haut.* By Dr. K. TIESENHAUSEN. Berlin: Urban and Schwarzenberg. Pp. 209. M.14.

IT is significant of the trend of modern surgery that the editor of a large system should himself write the sections dealing with pre- and post-operative treatment. Prof. Nordmann has compressed this vast subject into 110 pages, but his article is notable for its breadth of view, its sane outlook, and practical value. He lays stress upon the necessity for a full and fairly complete examination of the patient before submitting him to an operation. Only in this way can risks be estimated and dangers anticipated. Prof. Nordmann describes those methods which he has found to be helpful, criticises from experience others which he has discarded, and does not hesitate to point out deficiences in our knowledge of the treatment and prevention of complications such as thrombosis and post-operative lung affections. His views on the preparation of patients with pyloric stenosis, jaundice, heart affections, kidney diseases, to take a few examples, are all interesting, and the very emphasis laid upon the necessity for careful consideration of the patient from every point of view is likely to stimulate interest in an important aspect of surgery.

Dr. Tiesenhausen has written a satisfactory account of plastic skin surgery. The first part is general in scope, and is followed by a special part in which individual operations are described. Some of the less known and rarely practised procedures find a place in this section—for example, the substitution of a toe or finger for a missing thumb, and though the accounts are fairly adequate their value would have been enhanced if more details had been given. However, the reader can always refer to the original sources of information on the rare occasions when

specially detailed knowledge is required, and the bibliography at the end of the work will tell him where to look.

THE HARVEIAN ORATION, 1928.

Cardiovascular Diseases since Harvey's Discovery. By Sir HUMPHRY ROLLESTON, Bart., K.C.B., M.A., M.D., F.R.C.P., Regius Professor of Physic, Cambridge. London: Cambridge University Press. 1928. Pp. 149. 3*s.* 6*d.*

IN choosing this subject for his Harveian oration Sir Humphry Rolleston made a contribution to the history of medicine worthy of the tercentenary of publication of Harvey's famous work. Had he desired an alternative title he might with justice have called it "Who was Who in Cardiology." There are four chapters which deal respectively with the anatomical, clinical, instrumental, and physiological aspects of the subject, each chapter being followed by a bibliography giving proof of the amount of time and labour which the author must have devoted to compiling his oration. An author and a subject index add greatly to the value of the book as a work of reference.

BIBBY'S BOOK ON MILK.

Sect. II. *The Law relating to the Sale of Milk.* Twelfth edition. Liverpool: J. Bibby and Sons. 1928. Pp. 487. 30*s.*

THE miscellaneous contents of this section of Bibby's Book on Milk include a historical introduction, suggestions for the guidance of local authorities, analysts, milk vendors, and others, hints for the defence against milk prosecutions, the text of the Sale of Food and Drugs Acts and similar legislation, notes on the statutes, a summary of the case law, and a collection of statistics, departmental circulars, and statutory rules and orders. While this volume, entitled the Law relating to the Sale of Milk, is not a lawyer's text-book in anything save price, it gathers together much information not otherwise readily available. An editorial note for preoccupied readers explains that one object of the book is to expose the injustice of the present law and the need for its amendment. First, it is said, the law ought to be changed so as to separate the attempt to punish fraudulent adulteration from the attempt to control the quality of milk. Secondly, the fraudulent sale of adulterated milk being a mere form of theft, it is contended that the prosecution should be made to prove its facts and to establish the criminal intention of the accused in the ordinary way. Thirdly, if the quality of milk is to be controlled (and a policy of laissez-faire is nowadays in this respect unthinkable), the suggestion is made that the control should not be associated with criminal procedure.

These propositions are, of course, controversial. Though the powers of local authorities are unevenly exercised, and though our system of controlling milk-supply still tolerates too much tainted milk, we have reached improvement largely by the establishment of a hard-and-fast standard enforced by criminal prosecutions. It is true that the element of criminal intent is not insisted upon; but the community is entitled to protect itself in sanitary matters by weapons inappropriate in other circumstances. The householder whose chimney takes fire is liable to a fine however innocent his mind may be of criminal motive. The farmer or milk vendor is treated in the same summary fashion, but perhaps with better justification. Milk below standard may be pure and pure milk may be below standard, but it is doubtful if the good farmer and the honest milkman are in danger of heavy penalties in the course of their business. The reports of important cases are well set out though they naturally vary in length. The authors of the book deserve sympathy in that the Sale of Food and Drugs Acts, which they print in full, have been swept away (except in Northern Ireland) a few months ago by the consolidating Food and Drugs (Adulteration) Act of 1928. An addendum slip mentions this fact, and says the text of the new statute will be found in a supplement (Supplement 8, pp. 31, 9*d.*) which, in fact, has since reached us, together with Supplement 7, pp. 7, which gives an account of the case of Palmer *v.* Houson (Presumed Watering). The passing of the 1928 Act makes no substantial change in the law and leaves the decided cases untouched, but it alters the form of the statute law and upsets all previous references thereto.

MONGOLISM.

By KATE BROUSSEAU, Docteur de l'Université de Paris; Professor of Psychology in Mills College, California. Revised by H. G. BRAINERD, M.D. Baltimore: Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1928. Pp. 210. 20*s.*

ALTHOUGH this handbook is based upon ten years' personal experience of the care of mental defectives, its object is not so much to provide a first-hand authoritative treatise on the subject as to collate and compare theories of the many observers who have written on this difficult branch of psychiatry. Its bibliography is very full, and as a summary of the literature alone it is of great value. It also contains many carefully compiled tables of anthropological and psychological data obtained from mongols, is illustrated with many excellent photographs, and includes much practical advice on the management of these patients. The author's conclusions from the available statistics do not bear out many of the most accepted theories as to the ætiology; she cannot agree that the condition is due to reversion to a primitive mongol type, to parental alcoholism, tuberculosis, syphilis, or neurosis, to aged parents or reproductive exhaustion. She infers, as many other workers have been forced to do, that the cause must lie in some obscure disturbance of the ductless glands. Some endocrine disturbance, she says, may be found in every mongol. This opinion is not shared by Prof. Hans Curschmann in his recent work "Endokrine Krankheit"; he admits that the condition probably bears some relationship to endocrine disturbances, but holds that it is certainly not due to them.

EVOLUTION.

How You Began: a Child's Introduction to Biology. By Mrs. AMABEL WILLIAMS-ELLIS. With two prefaces by J. B. S. HALDANE. London: Gerald Howe, Ltd. 1928. Pp. 96. 2*s.* 6*d.*

IF anyone wants to teach a child that during the course of his individual development in his mother's uterus he has gone through the various stages of his ancestral evolution (or perhaps it should be "her," for little girls are believed to have more intellectual curiosity than little boys) they will find an admirable guide in this book. Most people will prefer that he or she should learn the Bible and the multiplication table. Like many books professedly written for children, Mrs. Ellis's will be most useful for grown-ups, and they are likely to read it with profit.

CLINICAL ASPECTS OF THE ELECTROCARDIOGRAM.

Second edition. By HAROLD E. B. PARDEE, M.D., Assistant Professor of Clinical Medicine, Cornell University Medical School. London: William Heinemann, Ltd. 1928. Pp. 242. 25*s.*

WHEN electrocardiography was first introduced its most obvious application to clinical medicine was in the diagnosis of the different types of cardiac arrhythmia. Since then our knowledge of the clinical aspect of these disorders has advanced considerably, and now in the majority of cases instrumental aid is no longer necessary for their recognition. Clinical electrocardiography has thus entered on the second phase of its career. It is being used to supplement the other methods of diagnosis in providing evidence

of those myocardial changes which fail to give rise to abnormal physical signs. In the various types of angina in particular the objective evidence of myocardial disease is often scanty, if not entirely absent, and it is in such cases that an abnormal electrocardiogram is of the greatest value. Some of these abnormalities, such as the changes which follow coronary occlusion, are now well recognised; but there are many features of abnormal records the significance of which is still obscure. A useful summary of the present position of our knowledge is given in Dr. Pardee's book. The author devotes four chapters to the description of the various abnormal features which are liable to appear in the auricular and ventricular complex. These chapters will be of interest to physicians who are already conversant with modern work on the diagnosis of heart disease. Another section of the book gives a clear and concise description of the more common electrocardiographic findings in disorders of rate and rhythm. The author points out that there are two groups of people who misjudge the value of this particular method of examination. The one group believe that electrocardiography can tell everything, and the other that it can tell nothing of practical importance. To both of these his book should prove a salutary corrective.

Two concluding chapters are devoted to certain theoretical considerations and to technique. With one or two exceptions, such as the statement on p. 129 that vagal pressure *never* fails to slow the ventricular rate in cases of auricular flutter, the views expressed are those generally held by workers in this field of medicine. The illustrations are well chosen and their reproduction is equally satisfactory.

AMERICAN MEDICAL ASSOCIATION OF VIENNA.

Twenty-fifth Anniversary Number. Pp. 306. *Ars Medici*. The Journal of the A.M.A. of Vienna. Vol. VI., No. 11. Published monthly in Vienna, IX. Spitalgasse 1 A.

THE first of these publications sets out the progress that has taken place in the work of the American Medical Association of Vienna, since it was established in that city at a Thanksgiving Day banquet in November, 1903. At its formation the Association had only 35 members; at present we learn that it numbers over 6000, more than 1000 having joined within the past two years. All medical men coming to Vienna for study are invited to enrol their names in a registration book kept by the Association, in return for which they will be furnished with information of the sort that they will require in a foreign city, and will be allowed free access to a reading-room and a reference library, and an institution where they will have opportunities both for scientific discussion and social intercourse. The bulk of the anniversary number consists of a detailed list of the clinical and pathological courses which can be arranged through the Association, with full names of the professors or lecturers, indications being given as to where the instruction may be met with. All the courses are conducted in the English language except where German is specifically mentioned as the only language employed.

Ars Medici is the latest achievement of the Society—its official monthly organ. It contains abstracts and reviews of foreign, especially Austrian and German literature, as well as particular notes on the activities of the Association.

ST. BARTHOLOMEW'S HOSPITAL REPORTS.

Vol. LXI. London: John Murray. 1928. Pp. 260.

THIS year's volume contains, besides domestic matter and abstract reports of the transactions of the Paget Club and the Abernethian Society, 17 original papers with many excellent illustrations. Of these the first seven deal with the respiratory system. Prof. F. R. Fraser contributes a short paper on dyspnœa, and Dr. F. G. Chandler and Dr. J. V. Sparks a practical article, illustrated by eight very clear X ray photographs, on the diagnosis of bronchiectasis by means of lipiodol injections. Pneumothorax is fully discussed in three contributions. Mr. J. E. H. Roberts describes the results of collapse therapy in eight cases of bronchiectasis, Dr. F. H. Young deals with the use and control of artificial pneumothorax in ambulant cases of tuberculosis, and Dr. R. Hilton with the more general aspect of the operation, including its history. Dr. C. Langton Hewer, in a paper on anæsthesia in thoracic operations, signifies a preference for nitrous oxide and oxygen, with differential pressure if the pleural cavities are opened; in extreme cases of obstruction from tumour he induces anæsthesia by chloroform and maintains it by the endotracheal method. Mr. Cortlandt MacMahon, the instructor of speech defects and breathing exercises at the hospital, describes the exercise treatment of empyema. Two cases of cystic serous meningitis of the posterior fossa, originating in the ear, are related by Mr. T. H. Just; Dr. E. Arnold Carmichael assesses the diagnostic value of the examination of cerebro-spinal fluid in ear and nose affections; and Mr. J. P. Ross writes on a number of cases of various intracranial injuries. Mr. J. Basil Hume reports the unfavourable results of the lead treatment of cancer at St. Bartholomew's. An unusual case of heart-block, with cardiograms, is described by Dr. Geoffrey Bourne; 50 cases of acute osteomyelitis are analysed by Mr. J. P. Hosford. Mr. Alexander Roche writes on torsion of the spermatic cord, giving case notes, tables, and bibliography, and illustrating his article with several microscopical pictures and a coloured drawing. Mr. R. T. Payne gives his experiences with the now popular sclerosing treatment for varicose veins; Mr. T. M. Thomas describes nine cases of femoral aneurysm, and Dr. E. M. Allott one case of rat-bite fever. As usual, the book is well bound and clearly printed.

JOURNALS.

INDIAN JOURNAL OF MEDICAL RESEARCH. Vol. XV., No. 2.—This number contains 26 papers of perhaps exceptional merit. H. E. Shortt, A. C. Craighead, R. O. A. Smith, and C. S. Swaminath describe transmission experiments in kala-azar with *Phlebotomus argentipes* which were, unfortunately, negative, and attempts to infect hamsters with *Leishmania donovani* by the oral and conjunctival routes similarly failed.—F. P. Mackie and S. N. Gore describe a hitherto unrecognised bacillus isolated from cases of sprue.—J. A. Sinton, in conjunction with P. J. Barraud, is responsible for morphological studies on some species of phlebotomus, and together with W. Bird and W. B. F. Orr has studied malaria with special reference to treatment.—P. J. Barraud contributes a study of the revision of the culicine mosquitoes of India.—R. N. Chopra collaborates with S. Ghosh and N. R. Chatterjee in a number of papers on the action of antimony compounds, concluding that it is doubtful whether urea stibamine is a compound of the nature suggested by its discoverer.—Contributions on Indian anophelines include papers by I. M. Puri on *Anopheles jeyporiensis* James and *A. moghulensis* Christophers, and on the relationship of certain morphological characters of anopheline larvæ to the classification of Indian anophelines in general. Bruce Mayne has found that *A. subpictus* can serve as host for the parasites of bird malaria.—E. W. H. Cruickshank and Sheonath Prosad have studied the action of insulin on the free muscle sugar of the normal and diabetic heart.—R. B. Lloyd and S. N. Paul have constructed protein graphs in kala-azar, both in treated and untreated cases.—G. R. McRobert has studied the hydrogen-ion concentration of the alimentary canal of the albino rat and has made observations on the size of the spleen, his results being in close accord with those of Barcroft.

THE LANCET.

LONDON: SATURDAY, JANUARY 12, 1929.

THE KING'S ILLNESS.

IT is now generally recognised that a startling improvement in the KING'S condition is not to be expected, but we are happy to say that no unfavourable developments have occurred during the past week. Events have justified the forecast that there would be ups and downs and that the course of the illness and of recuperation would consist in an increasing predominance of the former over the latter. Such progress, though slight, is definitely being made, and our readers will be especially glad to learn that the average rate of the pulse has diminished and that it is less easily disturbed by outside influences. In weighing the significance of these facts it must not be forgotten that there is still difficulty in feeding, wasting, and exhaustion, and that these cannot be overcome without long effort; especially is the exhaustion produced by the gallant and extended struggle for life, an element in the case which has throughout given the gravest anxiety. It is obvious that the moves forward at best will be slow, and that considerable periods may pass without any notable changes. For this we must be prepared, though it may not be easy for those who are watching the current of events to achieve an even frame of mind. From primitive times it has been the nature of mankind to demand miracles and to seek signs, and during a period of strain the press of the country has inevitably reflected this requirement. In the diligent search for some new thing an unwelcome prominence has lately been given to one doctor and to a new remedy, or rather to an old remedy revived in a new form. We offer our sympathy to Prof. DODDS, whose valuable biochemical investigations have been given too wide a significance in many quarters. Although he was able to give much assistance by analysis and by contributing to discussions on the data thus obtained, we are authorised to say that his advent on the scene did not coincide with any dramatic change either in the patient's condition or in the treatment adopted. His distinguished work at the Middlesex Hospital is so well known to the medical profession that he need fear no misunderstanding of the situation among his colleagues. But it is regrettable that among those who are less well-informed some of the speculations which we have read may have a misleading tendency. When such full information has been given regularly in the bulletins upon all the essential points in the story, it must be dangerous, however strong the temptation, to rely upon unauthenticated stories for views or judgments.

THE TREATMENT OF EARLY BREAST CANCER.

THE technique of the classical operation for cancer of the breast has long been standardised at a very high level of efficiency, and it is difficult to see how it could be further improved unless the whole paraphernalia of scalpels, clamps, and ligatures appertaining to a cutting operation are superseded. Many surgeons, however, are devoting attention to the development of a surgery of access, since, as Mr. SAMPSON HANDLEY pointed out in his Sylvanus Thompson lecture, published in our columns last week, a combination of surgery and radiotherapy may well lead us further than either could go alone. Such a view does not justify the exaggerated statements which have appeared recently in the lay press, where radium has been described as a "cure" for cancer which is likely to supplant operation. Such a statement is certain to do much harm, since it may induce patients to refuse an operation when operation is advisable; and it should not be made even for the wholly praiseworthy cause of collecting money from the public for the purchase of radium. Radiotherapy is no more a cure for cancer than is operation; it is a treatment the efficiency of which, like that of operation, depends upon the stage of the disease at which it is applied, and upon an understanding of the pathology of the condition. It would seem a truism to say that the successful treatment of a disease depends upon consideration of its pathology, were it not for the statement made by Mr. DUNCAN FITZWILLIAMS at a meeting of the Section of Surgery of the Royal Society of Medicine, reported on p. 74. He claimed that in the early stages of carcinoma of the breast the condition can be cured by a partial operation, removing only the growth and leaving the rest of the breast tissue behind. We believe that this procedure would be generally condemned as a retrograde step; indeed, this was made clear by some of the speakers at the discussion; but since the question has been raised, it may be timely to amplify some of the objections that were raised to a partial operation.

Only a few months ago Dr. JANET LANE-CLAYPON published a valuable monograph[1] in which she collected and classified the end-results of over 2000 cases of breast cancer treated at different hospitals by different types of operation, including the partial operation (removal of tumour only) as applied to so-called "early cases." This investigation, which was published by the Ministry of Health, was presumably carried out for the benefit of surgeons, but the lessons which it contains have apparently not yet been generally learned. An early case of breast cancer is, by definition, one in which the disease has not yet spread to the axillary glands. If such a case is treated by removal of the tumour only, the answer to the question whether the disease has, or has not, spread to the axillary glands rests entirely on the clinical examination of the axillary glands. On this point the figures quoted by Dr. LANE-CLAYPON are relevant. They show that

[1] Reports on Public Health and Medical Subjects, No. 51. Late Results of Operation for Cancer of the Breast. London: H.M. Stationery Office, 1928, and THE LANCET, 1928, ii., 507.

negative clinical findings for the axillary glands are incorrect in over one-half of the cases; that is, in spite of the glands not being palpable, they were, in fact, found to be invaded when examined microscopically. She points out that in just those cases which might be the most favourable a false clinical impression of the state of these glands may prejudice the patient's best chance of survival, since the radical operation is not always performed if the surgeon cannot detect enlargement of the axillary glands, and some practitioners still regard a case as non-malignant unless the glands of the axilla are palpable. It is admitted that the survival rates in those early cases where breast only or tumour only was removed approximate closely to those obtained for the radical operation; it may be conceded that in the majority of these cases the whole of the cancer was in fact removed, and therefore no recurrence was to be anticipated. If, therefore, the surgeon could be certain of removing the whole of the cancer in a conservative operation the results should be just as satisfactory as with the radical operation. Unfortunately, however, the palpation of the axillary glands has been proved to be unreliable, if negative, and to be incorrect in over half of the cases. In other words, it is impossible to diagnose with any degree of certainty an "early" case of breast cancer. Hence there can be little doubt that even in "early" cases there is a considerable risk if the radical operation is not performed.

There is yet another reason why, in breast cancer, removal of the tumour only is a dangerous gamble. The work of Sir LENTHAL CHEATLE, based on the histological examination of sections of the whole breast, has shown that the presence of a malignant new growth in one part of the gland is frequently associated with pathological changes in other parts, which represent a precancerous condition. Such a view is in accord with the results of recent work on experimental carcinogenesis. If, therefore, only the tumour is excised, that part of the breast which remains behind may contain several foci for the new development of further growths. Clinically, such a result would be described as a local recurrence, although it is really a new cancer, and Dr. LANE-CLAYPON'S figures show that in this type of operation recurrences are not infrequent. Sir LENTHAL CHEATLE'S method of studying whole sections of the mammary gland has shown the condition of "early breast cancer" to be a much more complex one than has hitherto been suspected, and has given valuable information on the types of epithelial hyperplasia which can be regarded as a precancerous condition. In fact, the many advantages of this method of ascertaining the state of the epithelium and the connective tissues of the breast in conditions which call for operative interference are so obvious that its general acceptance by clinicians and pathologists in this country and its extension to other organs is overdue. A recent Report of the Proceedings of the American Association for Cancer Research [2] shows that the value of the method has been recognised there, and by no less an authority than Prof. JAMES EWING. A change in nomenclature is always difficult to impose on a conservative profession, but Sir LENTHAL CHEATLE has, we think, made out a good case [3] for a drastic revision of classification of mammary swellings, and we commend the outcome of his arduous labour as a good starting ground for workers on breast physiology and pathology.

[2] Jour. of Cancer Research, 1928, xii., 258.
[3] THE LANCET, Jan. 5th, 1929, p. 37.

THE HEALTH OF THE YOUNG WORKER.

IT has been realised for some time that the extensive provisions made by the Government of this country for conserving the health of its workers leave two very important gaps unbridged. The first of these is the period immediately before school age, and this was the main problem to which the Board of Education's annual report drew attention last year.[1] Along the lines which Sir GEORGE NEWMAN then indicated some progress has been made, as he relates in this year's report (p. 96). There are quite a number of nursery schools where the toddler and the child under five can spend their days "playing at work" in a healthy atmosphere, with good food, and where they can learn the early adaptation to life which will help them when school comes along. Although so far only weakly children and those from poor environments have been selected, yet an attempt to trace the subsequent history of the nursery scholar has shown that all have held their own—in their teachers' words they have been found "alert, eager to learn, well-behaved and equipped with habits and attitudes which made for progress and happiness." The solution of the problem may have been arrived at, and we must hope that such accommodation will be extended until all who can benefit from the provision can be accepted at nursery schools.

The outlook for the "post-school child" is less happy than that for the "pre-school child," and Sir GEORGE NEWMAN devotes considerable attention this year to the position left by national medical services between the school-leaving age and the age when the young worker can be enrolled under the National Health Insurance Act. The child who leaves school at 14 nowadays is healthier, heavier, taller, cleaner, and altogether a better and more promising individual than was the child who left five or ten years ago. To-day this young citizen loses less time from his work owing to sickness; there is less malnutrition, less tuberculosis, less glandular disease, less defective sight and hearing, better teeth. To a certain extent —though not yet universally—he has received instruction on how to keep fit, and year by year the education authorities strive to make this teaching more practical and to instil the habit of hygiene more thoroughly, so that the adolescent may keep his health into maturity. Yet there is a place where the promise is not fulfilled; in the two or three years succeeding the leaving of school the average boy and girl tend to go backward in health. With the best of teaching at school it is, perhaps, too much to ask of them that they should maintain hygienic habits without any encouragement or assistance, for, as Sir GEORGE NEWMAN points out, the adolescent is a gregarious animal and he will follow his herd. Apart from movements such as the Boy Scouts and Girl Guides, there is no organisation for stimulating healthy living. The young worker is nobody's business. The Committee on Education and Industry has recently issued a report dealing with the public system of education in relation to trade requirements.

[1] THE LANCET, 1927, ii., 1245.

This report urges close and continuous coöperation between the life of the schools and the life of the office or workshop, so that the two would no longer be disconnected episodes, but from both sides would be regarded as a single period in the training of the citizen. From the point of view of health continuity is a paramount necessity. This second gap is bridged in certain cases—relatively few but extremely important—by a factory welfare scheme. Large and progressive firms are realising more and more that it pays to provide medical advice and sickness benefits for their employees, and in many cases the firm's doctor is in close touch with the school medical officer. He examines the young employees periodically, treats minor ailments, and sees that defects are remedied. Were such provision for continuity universal, the gap would be effectively bridged; unfortunately this occurs in only a very small proportion of the young people who leave school every year, and the more efficient it is the more carefully is the entrance guarded, so that in effect it is the healthiest and strongest who receive this care. Other lines along which a bridge might be built are indicated by the juvenile employment and advisory bureaux and the work of the certifying factory surgeon. In Birmingham, information from the medical cards of school-leavers is filed by the employment bureau, so that unfitness for any particular kind of work is recorded, and similar coöperation has been arranged in other districts. The examination of the certifying factory surgeon is simply one to ascertain fitness for a given employment; it cannot be regarded as a satisfactory review of the child's health. Where the certifying surgeon is also a school doctor, and still more, where he is also the medical officer of a firm's welfare scheme, continuity between school and factory is attained; with this situation in view the Board of Education is anxious to ensure closer coöperation between school inspection and certifying inspection, and is willing to transmit medical records for this purpose.

It is obvious that the present position offers several possibilities, but that the establishment of a really satisfactory scheme of care for the young worker presents grave administrative difficulties. We may anticipate an increasing number of factory welfare schemes and an increasing sense of need for coöperation between individual certifying factory surgeons and school medical officers. This, however, is not enough. There should be some official scheme, comparable in excellence with the School Medical and Infant Welfare Services, to ensure that the health of our growing population at the critical ages of 15 and 16 shall not depend on individuals or vary in different localities. Most important of all, perhaps, the scheme must include supervision of the health of those who are not actually engaged in employment. This is brought home to us by the present lamentable situation in the mining districts. It is no unusual thing to meet young men there who, since the time they left school six or seven years ago, have never done a day's work, through no fault of their own. However greatly the young worker may need medical supervision there can be no doubt that the young workless boy and girl need it far more. Idleness is the most unhealthy environment an active organism can have, and its effects are not confined to the purely psychological field, as every practitioner knows. Idle or employed, the period of adolescence is perhaps of all periods that when to dispense with medical help can be least afforded, and the opportunity for obtaining health-teaching at this critical age should be forthcoming.

MATERNAL MORTALITY.

SINCE 1917 every puerperal death occurring in Aberdeen has been notified to and investigated by the local authority, this scheme having been instituted by Prof. MATTHEW HAY when he was medical officer of health of the city. His successor, Dr. PARLANE KINLOCH, with the assistance of Dr. J. SMITH and Dr. J. A. STEPHEN, has thus been able to collect, over a decade, statistics of 252 deaths occurring in 37,984 confinements. They have reviewed this material in a report on Maternal Mortality in Aberdeen, 1918–27 (H.M. Stationery Office, 1928, pp. 60, 1*s.*). No definite relation between environmental conditions and puerperal mortality were revealed by the inquiry and no new light was thrown on the influence of personal factors such as age, occupation, or habits of the mother, illegitimacy, or syphilis. The hæmolytic streptococcus was incriminated as the most important bacterial cause of puerperal sepsis, but on theoretical grounds little encouragement is given to the hope that any general scheme of prophylactic immunisation against this group would be feasible at present. On the other hand, statistical evidence was obtained of the value of antenatal services in reducing maternal mortality, and the expansion and improvement of these services is considered highly desirable.

The most interesting analysis concerns the comparative maternal death-rates in the practices of doctor, midwife, and institution. Table XII. shows that the death-rate per 1000 maternity cases delivered by midwives is 2·8, by doctors 6·9, in institutions 14·9. This last figure, which includes only cases untouched before admission, is surprisingly high; it is attributed by the authors to contagion—the term being used to embrace all the channels by which any droplet or spray infection, such as a streptococcal infection, is spread. The suggestion is not that infectious mucous secretions or purulent discharges could possibly be conveyed by trained attendants directly from uterus to uterus, but that a carrier may spray streptococci on to sterilised hands or instruments and these in turn infect the maternal passages. On this theory outbreaks of puerperal fever could be materially diminished in number and gravity by restricting the number of patients admitted to each ward and spacing their beds.

A suggestive fact is that there were no deaths among the 445 midwife cases in which forceps were used by the doctors called in to help. The authors discuss and reject the argument that the higher puerperal death-rate in the practice of doctors is necessarily due to trauma caused by premature instrumental interference, and hold that this is more likely to be due to contagion spread by carriers, doctors being more liable to become streptococcal carriers than midwives. Criticism of this and other conclusions will doubtless be welcomed by the compilers of this report, whose constructive scheme for the development of a new midwifery organisation will not escape dissent. But the figures provided are of the utmost value, and if they prove to be typical may well form the basis of reform of the midwifery services of Great Britain.

ENLARGEMENT OF ALTRINCHAM GENERAL HOSPITAL.—Prof. A. H. Burgess, of Manchester, has just opened an enlargement of this hospital, which has cost £10,000. The additions consist of a four-storey block with a male surgical ward, two private wards, a children's ward of 12 beds, and an enlarged operating ward.

Annotations.

"Ne quid nimis."

PUBLIC HEALTH AND LOCAL LEGISLATION IN 1928.

As has often been observed, our local Acts contain experimental legislation which, if found satisfactory in a limited area, can afterwards be extended to the country at large. In other words, what a local Act says this year a general Public Health Act may say in ten years' time.

The chief innovations in the local legislation of 1928 seem to be visible in the Sheffield Corporation Act, whereof several clauses may furnish useful precedents. The corporation, for instance, is authorised to construct inspection chambers at its own expense for the purpose of examining the nature of the discharge into sewers from manufacturing premises; in addition to the power to prevent the discharge of solids and offensive liquids into sewers the corporation has taken power to provide plant and buildings for treating and utilising refuse. Another clause allows the corporation to require the conversion of all other kinds of closet into ordinary fresh-water closets, cess-pits being got rid of, and the corporation bearing not less than one-third of the cost. Other novel provisions in the Sheffield Act belong rather to local government than to public health; by-laws, for instance, may regulate the thickness of garage walls and the providing of projecting hoods over garage openings; a £50,000 fund for land purchase may be formed with a contribution not to exceed a twopenny rate from the ratepayers' pockets annually; and, as a matter of organisation, the power to delegate authority to committees is extended. London and Rotherham, as well as Sheffield, have taken powers for the removal of infirm and diseased persons to institutions on an order by the justices. At Rotherham a justice's warrant may now authorise a medical officer of health to enter any premises where it is believed that there is dangerous infectious disease. The extended definition of infectious disease is among the new health provisions of a number of local authorities—Dartmouth, Exeter, Caerphilly, Llandudno, Cleethorpes, and Bridgwater, as well as Sheffield. The urban district council of Cleethorpes has taken power to appoint deputies to various officers including the medical officer of health. Other more familiar features of various local Acts of 1928 are those requiring the giving of information to medical officers, or requiring laundrymen's names to be furnished, or (as at Stoke-on-Trent) requiring dairymen to furnish lists of their customers. Llandudno, Cleethorpes, Sheffield, and Bridgwater now have powers for the municipal supply of antidotes; other forms of municipal activity are the London County Council's powers as to golf courses and Blackpool's to provide and run an aerodrome. It is nowadays hardly necessary to mention common clauses such as those as to tuberculosis (disinfection of premises and prohibition of infected persons handling food), or schools (parent to notify head teacher of child's infectious disease, and power to close Sunday schools or entertainments during epidemic), the cleansing of filthy premises, the inspection of stables, and the removal of dead bodies. In addition to the now almost universal legislation in respect of ice-cream and potted meat manufacture, Sheffield has taken power to refuse the registration of premises for such manufacture. An Exeter precedent is worth noting; the corporation is to register not only the premises used for ice-cream manufacture and sale, but also the manufacturers, vendors, merchants, or dealers themselves. As the Select Committee on Local Legislation observes in its last report, if registration applies to premises alone, a dealer can, after complaints against his premises, move outside the borough and bring in ice-cream manufactured under insanitary and unsupervised conditions. Cleethorpes has arranged for the registration of persons dealing in shell-fish, Dartmouth for regulating fried-fish shops, and Dudley for prohibiting the inflation of meat carcasses. In a number of areas food poisoning is made notifiable. Exeter has fresh powers of closing registered slaughter-houses—e.g., when the premises have been unused for six months.

Details of these and other items are to be traced in the official index to the local and private Acts of the session, published by H.M. Stationery Office (price 1*s.* 6*d.* net). This publication covers the main session of 1928—i.e., that which ended in August. Some progress was made with other proposals for local legislation during the autumn session which was adjourned on the eve of Christmas, but the Bills then dealt with must wait till 1929 for their chance to pass into law.

MALARIA IN CORSICA.

THE ill-effects of malaria in Corsica have led to a series of flying visits and reports by experts, such as those by E. Roubaud and M. Leger in the spring of 1921, and by the brothers E. D. and E. T. Sergent, with L. Parrot and A. Donatien, in the autumn of the same year. Again, in 1922, the Société de Pathologie Exotique pressed the urgency of the problem on the French Government, who in turn requested the League of Nations to conduct an independent inquiry—effected by E. Marchoux and L. Raynaud in 1925. Finally, in 1926, mainly under a subvention from the Division of Hygiene of the Rockefeller Foundation, the policy of hurried inspections gave place to a continuous investigation under the general direction of Prof. E. Brumpt, and consisting of a laboratory at Bastia, in the north of the island, outside the malarious zone, and a dispensary at Porto Vecchio within it. An interim report on this important work is now issued.[1]

After sketching the history of malaria and anti-malarial measures in Corsica, Prof. Brumpt's report deals with matters as they are. The population is just over 250,000, yet outside the island are twice that number of Corsicans, valuable members of the French Colonial administrations. Within the island an arresting feature is the extent of the daily or seasonal migration from the malarious eastern coastal plain to the healthier hills. For example, of the 4500 persons classed as inhabitants of Porto Vecchio, never more than 2000 live there, the figures in the malarious season falling to 600, while malarial infection, established by the finding of plasmodia, is four times greater in those who stay than in those who flit. All three species of plasmodia are present, the dangerous subtertian, the quartan, and the tertian prevailing in that order. The wide coastal marshes breed anopheles even when the salinity is as high as 26·32 g. to the litre, but where iron causes an irridescent scum, larvæ are absent. Nearly all anopheles are *A. maculipennis*, few adults have been found infected, and the inquiry shows that, as elsewhere, hibernation is by impregnated females, not by eggs as had been locally suggested. As a larvicide, dusting with Paris green has been found most efficient, yet the extent of the water surface to be covered is held to preclude its general use. The employment of an aeroplane for the purpose, well reported on from the United States, is not considered, but from the description of the country would seem to hold great promise. Local conditions are considered unsuited for oiling, but *Gambusia holbrooki*, introduced from America and bred at Bastia, has been strikingly larvicidal in nearly every local type of water. A screen of animal houses is believed to have been of marked value against attacks of the adult insect in certain cited instances. Quinine, it is urged, should not be issued wholesale for use as a general prophylactic. Its action is more economically concentrated on the infected.

The scheme in existence aptly materialises the advice of the first subcommittee of the Malaria

[1] La lutte contre le paludisme en Corse. Paris: Masson et Cie. 1928. Pp. 94. Fr.16.

Commission of the League of Nations (see THE LANCET, 1928, i., 664) in the right selection of a leader, giving time for his schemes to fructify in special research into local conditions, and in the application of those means of prevention which that research suggests as being the most promising for that locality.

NITROUS OXIDE AS A SUPPORTER OF COMBUSTION.

THE power of nitrous oxide to support combustion is often ignored, if indeed it is known at all. A suggestion was recently made in our own columns, for instance, that the gas might on emergency be used instead of compressed air to avoid the possible risk of concentrated oxygen when liquid paraffin is employed for lubrication. Yet the fact is that nitrous oxide contains double the proportion of oxygen present in atmospheric air and in a form which is readily available for combustion. The idea seems still to survive that nitrous oxide is inert, much in the sense that nitrogen itself is inert, although Hewitt states in his text-book, "When a burning body is placed in the gas the latter is decomposed and combustion is supported." The risk may be put a little more strongly than that. Prof. H. H. Dixon has shown[1] that in some combinations nitrous oxide helps to form an explosive mixture more readily than does oxygen itself. Testing ethylene and propylene mixed with air, oxygen, or nitrous oxide, Dixon found that the ignition points were actually lower with nitrous oxide than with oxygen. Nowadays when mixtures of ether or ethylene with nitrous oxide are so frequently employed for general anæsthesia, it should not be forgotten how readily nitrous oxide provides material for explosion under favourable conditions of temperature and pressure.

HISTOLOGY AND PROGNOSIS IN CANCER.

OF late years a good deal of attention has been paid to the relationship between the histological character of a malignant growth and the prognosis following radical operation. For example, D. H. Patey and R. W. Scarff[2] divide 50 cases of cancer of the breast, operated upon five or more years ago, into three histological types, and on analysing the ultimate results find, as might be expected, that the prognosis in the less malignant types is very much more favourable than in the others. They also note that there is a preponderance of the more benign types of growth in the early cases, showing that the favourable stage lasts longer in cases of this type. A parallel investigation of carcinoma of the cervix treated by radium at the Memorial Hospital, New York, has been described by W. P. Healy.[3] He has taken for investigation a block of 200 cases treated in 1922 and 1923, and he, too, divides his cases into three groups, which he calls the adult, the plexiform, and the anaplastic. During the period under review 25 advanced cases of the adult or least malignant group were treated, and only one of these patients was well after four and five years (4 per cent.). In the anaplastic or most malignant group there were 14 survivals out of 33 cases treated (42 per cent.). This is in striking contrast both to Patey and Scarff's results with the operative treatment of carcinoma of the breast, and with other studies on the operative treatment of carcinoma of the cervix, which all show that the best results are obtained when the growth is of the adult type. Thus at the Johns Hopkins Hospital 47 per cent. of cases of the adult type survived and only 9·5 per cent. of the anaplastic type. The figures from the Mayo Clinic are similar—namely, 53 and 9·5 per cent. Healy finds that in operable cases the prognosis for cases treated by radium varies little with the histological characteristics. If his findings with the inoperable cases truly represent the response of particular types of growth to irradiation, this lack of differentiation can probably be explained by the early lymphatic spread of more rapidly growing types of growth. When compared with the results of operation his figures are still very striking, and, on the whole, it is evident that the factors which influence prognosis are quite different in the two main methods of treating cancer. Whereas with surgery the outlook is better the more stable the type of growth, with irradiation it is the unstable, atypical, and more rapidly growing neoplasm which reacts to treatment.

[1] THE LANCET, 1927, i., 247.
[2] Ibid, 1928, i., 801.
[3] Amer. Jour. of Obst. and Gyn., 1928, xvi.

THE INDIAN MEDICAL YEAR.

YEAR by year Lieut.-Colonel R. Knowles, I.M.S., of the Calcutta School of Tropical Medicine, with the assistance of collaborators in various provinces, edits a review of medicine, surgery, and public health in India, which is published as a supplement to the *Indian Medical Gazette*. The 1927 review contains 48 pages, of which the greater part is devoted to questions of public health and research. It may be assumed that the comparative neglect of clinical medicine is not the editor's fault, but is due to the fact that practising physicians and surgeons in India are busy men who do not readily commit their work to writing. The period under review includes the meetings of the Congress of the Far Eastern Association of Tropical Medicine in Calcutta which added so greatly to the interest of the year. Sir Ronald Ross's tour in Malaya and Assam afforded a much-needed stimulus to antimalarial work. The fact that it is the commercial interests that are setting the lead to-day in the control of malaria lends point to Sir Ronald's contention that a large-scale official campaign would soon justify the necessary outlay. The situation is not without its humorous side, for at the Presidency General Hospital in Calcutta, where much of his work was done, both he and the guests assembled in his honour were ferociously attacked by mosquitoes. In spite, however, of slow progress in some directions, a serious effort is really being made in many places to cope with malaria, and the necessary knowledge is being steadily accumulated. A malaria survey of the tea gardens of Assam has been completed, and much labour is being wisely expended in studying the anopheline mosquitoes, particularly with regard to their habits and environment.

At the Haffkine Institute in Bombay efforts are being directed towards producing a potent serum for the treatment of plague and improving the present prophylactic vaccine. Cholera has also received much attention from various observers, one of whom claims to have established that non-agglutinable can be transformed into agglutinable vibrios under suitable conditions. If this supposition is proved to be correct it may profoundly alter our ideas of immunity in this disease, both during an epidemic and at subsequent reinfections. The old controversy between the supporters of the hypertonic and isotonic saline injection methods of treatment for cholera has again cropped up, and it seems clear that there is a considerable body of clinicians who favour the use of isotonic fluid, combined with adrenalin. The prophylactic value of inoculation on a large scale, in order to lessen the number of carriers, seems to have been proved in Java, and this would certainly deserve attention in India were it not for the religious and other prejudices which stand in the way of compulsory measures of the kind. In dysentery there has been no marked advance to record, unless the claims of d'Herelle with regard to his bacteriophage treatment are supported by further experience. Bacteriophage may also prove a potent remedy for cholera if the hopes of the discoverer are realised. Kala-azar is perhaps the brightest spot in tropical medicine during this period. Both diagnosis and treatment have been revolutionised. The reports on leprosy are encouraging, and it is stated that the results of recent methods of treatment justify the belief that we are now dealing with a curable disease, especially if taken at an early stage. Further work which has been done on epidemic

dropsy appears to point to the rice bacillus, and poisons generated by it in the damaged grain, as the causative agent, but this theory is not yet generally accepted.

The review gives a large amount of detailed information on public health work in the various provinces; the appalling conditions which exist, not only in the smaller communities but also in many considerable towns and cities, are at last attracting more attention. Interest in child welfare and the training of dais or native midwives is extending rapidly, and India is evidently awaking to the facts of maternal and infant mortality, though the process of prevention must be slow. Amongst recent public health advances should be mentioned the campaign against hookworm which is being carried on in the tea and rubber districts of the Southern Presidency. It is stated that round-worm infestation is probably of equal or even greater importance in India. In the sphere of medical education the most important event of the year was the second tour of inspection of the principal medical schools by Sir Norman Walker on behalf of the General Medical Council. His friendly if sometimes trenchant criticisms have already borne good fruit.

THE CAUSE OF POMPHOLYX.

WHEN Tilbury Fox first described vesicular eruption in the finger-webs as a clinical entity he regarded it as a retention disorder of the sweat glands. This view has been conclusively disproved, but the name dysidrosis has not been discarded, although pompholyx (blister) is less misleading. The ætiology of these common affections is still in dispute, and there is some evidence that they are increasing in frequency. The Japanese have always held that most if not all, vesicular disorders of this kind on the extremities are due to a mycosis, and the evidence brought forward by Y. Taniguchi [1] for pompholyx of the feet goes far to support this contention, which is also upheld by Jean Darier,[2] who says that a fungus can be recovered in no less than 80 per cent. "des cas presentant l'aspect de la dysidrose." Taniguchi does not concern himself in this study with the palmar cases, which he admits need further investigation, but in the 50 cases of plantar pompholyx examined he never once failed to recover fungi which in their cultural features closely resemble the group described by Sabouraud as *Trichophyton radiolatum*. He did not content himself with histological demonstration and cultural recovery of the pure mycelium; he went a step further and inoculated it into five persons who submitted the skin of their feet to the experiment, and he succeeded in accurately reproducing the typical clinical manifestations of itching and vesiculation, the organism being again recovered in each case. He claims that as far as the feet are concerned his experiments seem to rule out the existence of an "idiopathic dysidrosis." He evidently believes that the same conclusion will eventually be reached as regards the hands, and points out that *Epidermophyton inguinale* was isolated in five out of 13 cases of interdigital eczema examined in the course of his experiments.

THE TECHNIQUE OF PROSTATECTOMY.

JUDGING from reports [3] of the fortieth annual meeting of the American Association of Genito-Urinary Surgeons the ideal technique of prostatectomy seems to be as much in doubt on the other side of the Atlantic as it is here. Not only are urologists divided into two fairly distinct schools, according to their preference for the perineal and the suprapubic route, but within these schools there are many different opinions as to how the operation should be done. Especially noticeable were these differences of opinion in the discussions on post-operative hæmorrhage, which showed that there are those who pin their faith to suture as a means of dealing with bleeding, and an equally large number who rely on packing or on some form of hæmostatic bag. W. E. Lower, who belongs to the suture school, is so confident of his methods that he is prepared as a rule to dispense with drainage and to close the bladder. C. H. Chetwood, who follows Lower's method of suture, has not gone so far as this and uses a small drainage-tube. Greater unanimity was shown on the subject of local anæsthesia. Edwin Davis reported 176 consecutive cases of perineal prostatectomy operated on under sacral anæsthesia, with excellent results. H. G. Hamer, on the other hand, prefers local anæsthesia. He is a partisan of the suprapubic route, approaching the bladder through a median incision previously infiltrated from the pubes to the umbilicus with Schlesich's solution. In the discussion on Davis's paper, Hugh Young raised the objection that sacral anæsthesia is difficult to induce, requires special training, and is liable to consume a great deal of time. He himself had found that caudal anæsthesia was usually sufficient and that it was unnecessary to make the lateral injections into the nerves as they emerged from the canals in the sacrum in order to get excellent anæsthesia for perineal prostatectomy. At first, he said, he had employed 50 c.cm. of a 1 per cent. solution, but with this technique there had often been a rapid and pronounced drop in blood pressure owing to the drug penetrating to the dorsal region. He had, therefore, substituted a 3 per cent. solution of which he injected only 20 c.cm. With this technique an equally satisfactory anæsthesia was obtained without the drop in blood pressure. In only 5 to 8 per cent. of cases had it been necessary to supplement this with a small amount of gas and oxygen.

THE EARLY VICISSITUDES OF QUININE

FEW remedies are in such universal demand as quinine, and few have passed through such difficult times before their value became established. The drug must have been used by natives from time immemorial, and there are many traditions of its origin. An unlikely one is that an earthquake precipitated some trees into a pool, where they rotted and infused the water with their bitter essence; a fever-stricken Indian chancing to drink the water was miraculously cured. This may have happened, but even if the Indian had connected his experience with the trees—a feat quite beyond most minds at his stage of development—it would have taken the tribe hundreds of years to improve on the method of throwing trees into a lake to rot, and the story goes that the use of the crushed bark sprang into prompt acceptance. Another suggestion is that the natives imitate the local carnivora, which are said to gnaw the bark of the tree when they feel ill, somewhat as dogs eat grass. Dr. S. Abbatucci,[1] summarising a recent lecture by Dr. Alessandro Canezza, director of the Lancisian Library at Rome, agrees with the legend that the first person to import quinine into Europe was the Countess de Chinchon, wife of the Spanish Viceroy of Peru. This seems a more probable derivation than the alleged Inca expression "china-china" (food), suggested by one authority. The Jesuit missionaries, who had known it for some time, treated her with it for malaria, and she was so impressed that when she and her husband went back to Spain in 1639 they took a supply with them and distributed it broadcast under the name of Jesuit's powder. A few years later a superior of the Order of St. Ignatius de Loyola, Father Bartholomew Tafur, employed it with success on Louis XIV. when he was Dauphin, and its renown spread into Belgium and England. In this country, however, where Protestant fervour was at boiling-point, the drug was anathematised as an invention of the Devil. Lively controversy about its value soon took place on the Continent. The Governor of Belgium, Leopold

[1] Jap. Jour. Med. Sci., 1927, i., 43.
[2] Text-book of Dermatology, Philadelphia, 1920, p. 85.
[3] Trans. Amer. Assoc. Gen.-Ur. Surg., 1928, xxi.

[1] Revue de Méd., 1928, No. 4, 563.

William of Austria, had been treated with quinine for a tertian fever; he had a relapse and his physician, Chifflet, advised him not to continue the treatment. The ingenious Chifflet held the new remedy responsible for his death, and inveighed against its uncertainty and dangers in a pamphlet. H. Fabri, director of the penitentiary of St. Peter at Rome, replied, after the manner of the age, at great length and with some acerbity. Others took up this leisurely duel, which lasted long after Chifflet's death in 1671 had spared him the mortification of seeing the success of quinine. One of its most ardent supporters during this warfare was the Cardinal of Lugo, whose energetic championship gave it the alternative name of Cardinal's powder. The Roman College of Jesuits which, like most religious houses of note, had its own dispensary, was the chief centre of distribution for the drug. In the sanctuary of the Hospital of the Holy Ghost there appears a series of artistic frescoes in which the Cardinal is depicted as distributing quinine to the sick, the Count of Chinchon as receiving it from the Indians, and his lady as taking a therapeutic draught of it. The progress of quinine was hampered by numberless imitations, for it was quite easy to sell large quantities of any root such as valerian, crushed and flavoured with aloes, under the name of cinchona bark. Nevertheless, like most good things, it triumphed in the end, and its struggles have been almost completely forgotten, for few medical men, except those especially concerned with the history of medicine, have ever heard of pulvis patrum, remedium anglicum, or Jesuit's powder.

THE LATE CONSTANTINOPLE BOARD OF HEALTH.

THE internationalisation of preventive medicine has made remarkably rapid progress in the last two decades. The first impetus was given to the process by the establishment, as the result of the Rome Arrangement of 1907, of the International Health Office, with seat in Paris. This was followed, some 12 years later, by the creation of the Health Organisation of the League of Nations, which, while leaving the powers and functions of the Paris Office largely untouched, absorbed it into itself, as the General Advisory Health Council of the League. With these bodies the future of the international control of disease mainly lies. In the past, before this process of centralisation had been carried out, such international control was more or less limited, geographically and otherwise, to the efforts of the four International Boards of Health to prevent the infection of cholera, plague, and other diseases from invading Europe from the Eastern countries, where they are more or less constantly present. Those Boards—of Alexandria, Tehran, Tangier, and Constantinople—came into being at different dates in the last century; their existence was recognised and their mandates more or less clearly defined by the successive International Sanitary Conferences—from the first one in 1851 down to the latest, that of 1926. The Alexandria Board continues to function, and now plays the principal part in maintaining the sanitary barrier between the East and Europe; its powers were considerably enhanced and extended by the International Sanitary Convention of 1926. The Tehran Board also continues to exist; its powers and its mandate have always been more limited than those of the Alexandria or the Constantinople Boards, as readers of THE LANCET will have gathered from the interesting articles from the pen of Dr. A. R. Neligan, the British delegate to the Board, which appeared in our columns in 1926. The Tangier Board has never possessed the importance or powers of the other three Boards; as a result of recent political changes in Morocco the area of its labours is now limited to the small internationalised zone of Tangier and the immediately adjoining territory. Finally, the Constantinople Board has ceased to exist, and a purely Turkish administration is now charged with the sanitary defences of the greatly diminished Turkish coasts and frontiers. In 1923 we published a series of articles relating the history of that Board, written by Dr. F. G. Clemow, who was for so many years the British delegate to that body. To-day we publish a "Supplementary Note" by the same author, throwing further light on the origin of the Board and on many points connected with its history. It should be counted to the Turks for righteousness that, years before the Constantinople Board existed, they themselves conceived the grandiose scheme of a great lazaret on the Bosphorus, with a central sanitary board and health offices in the principal Turkish ports; and that, as far back as 1837, they put forward proposals that clearly foreshadowed the modern practice of "surveillance"—as distinct from "observation"—as a defensive measure against the spread of plague. Though admittedly a "footnote to history," the article, as such "footnotes" frequently are, is illuminating on many matters of interest, from the extraordinary fanaticism of certain races in the presence of disease to the process, only briefly mentioned, of liquidating a long-established and complex body like the Constantinople Board of Health and the organisation it administered.

EXTIRPATION OF THE GALL-BLADDER.

A STUDY of the literature of surgical treatment of gall-stones reveals a difference of opinion between those who regard cholecystectomy as an operation of unconditional choice and those who defend the efficacy of cholecystotomy. Direct investigations intended to define the intimate function of the gall-bladder seem to have been somewhat neglected so that we have no exact criteria of the effect of its ablation, many surgeons speaking of cholecystectomy as they would of an operation to remove a useless appendix. Such a view is opposed by Prof. G. Balice,[1] of the University of Naples, who is convinced that the gall-bladder has a physiological importance far beyond that of a mere receptacle or reservoir, though he admits that its extirpation is not harmful to the organic economy except indirectly and by the possible consequences of an exuberance of intestinal flora due to an absence of inhibition by the cystic bile. Some authorities, he says, think it necessary to take away the gall-bladder to prevent the formation of calculi, but this theory must be accepted with reserve since calculosis has been observed after cholecystectomy with or without reformation of a biliary vesicle from the stump of the cystic duct—not to mention those cases in which there is calculosis of the bile-ducts with congenital absence of the gall-bladder. He considers it justifiable to extirpate the gall-bladder to avoid the dangers of a subsequent cholecystitis, but maintains that such intervention cannot be justified on the mere suspicion, for instance, that typhoid bacilli are lodged there. Mayo Robson is quoted as holding that cholecystectomy is unnecessary in ordinary cholelithiasis when the gall-bladder is not seriously damaged and the cystic duct neither ulcerated nor constricted; Robson's statistics in 1917 showed 53 per cent. of complete recoveries after cystotomy and 71 per cent. after cystectomy. Some surgeons, Prof. Balice continues, have always been in favour of cholecystotomy, and Harris Brownlee maintains that the gall-bladder acts as a safety-valve for the liver, and cites cases in which recovery was impossible as it was found to be atrophied and empty. From his study of reported cases of operation on the biliary passages Balice has come to the conclusion that more attention has been paid to the anatomical and surgical problem than to estimating the physiological importance of the organ extirpated, and that researches have been directed more to attaining surgical perfection in the different modes of intervention than to estimating the disequilibrium caused by loss of the gall-bladder. Whilst agreeing that it should be

[1] Policlinico (Surgical Section), Nov. 15th, 1928.

removed whenever there is reason to fear that its presence would entail worse evils, he believes that it should otherwise be preserved. It is only by such action, he remarks, that the surgeon will show that beyond a passion for operation he has a scientific culture which guides him in interpreting the phenomena he is called upon to treat.

Considerable sympathy will be felt with Prof. Balice's views; at the same time we have clinical evidence from thousands of cases that cholecystectomy is very often harmless—that human beings can get on well without a gall-bladder. There is also evidence that a compensatory mechanism is set up after cholecystectomy. Beale in 1889 first described small parietal saccules, in the walls of the bile-ducts, which apparently have a similar function to the gall-bladder. These saccules are strongly developed in animals, such as the horse, in whom this organ is absent, and in his Mütter lecture to the Royal College of Physicians at Philadelphia in 1923 J. E. Sweet described how, after cholecystectomy in dogs, the parietal saccules grow out and branch and seem to take on the function of the gall-bladder which has been removed.

THE INDUSTRIAL HEALTH EDUCATION SOCIETY.

A MEMORANDUM has been circulated by this Society setting out its objects and affirming the need for health propaganda among workers, both in order to mitigate sickness and disease of an occupational nature and to instil sound teaching on matters of health generally. The need for such health propaganda was shown in a recent report of Sir George Newman, wherein it was stated that in 1927 30½ million weeks' work was lost through sickness and disablement among insured workers alone, while £30,000,000 was spent in sickness benefit and medical treatment among these same persons. For three years the Society, getting the services of doctors free, was able to organise health-talks of pertinent interest to every class of worker; but the fees and out-of-pocket expenses and the supplying of medical literature, often costly, in order that the lecturers might speak from the latest information has depleted the available funds, and this at a time when success has stimulated the Society to extend its operations. In 1927 the income was £2254, while it is now estimated that if the large and growing demands for the services offered are to be met the annual expenditure will have to be at least £5000. A confident eye, however, is turned towards the various employers' organisations, individual firms, and trades-unions for generous support. All will agree with the Society in feeling that the healthier the workers are the better will production be, with benefit alike to employers and employed, so that the Industrial Health Education Society has no difficulty in making out a strong claim for support. The hon. President of the Society is Sir Humphry Rolleston, the general secretary Mr. James Mackenzie, and the address 84, Kingsway, W.C.

Lady Singer has given £500 to the Royal Society of Medicine in memory of the late Sir David Ferrier, F.R.S., with whose work she was associated for some years. The money is to be invested and the income used for the purchase of neurological works for the library. Each book so purchased will bear a memorial bookplate.

Prof. J. H. Zaaijer, of the University of Leyden, will deliver the Hunterian lecture of the Hunterian Society at 9 P.M. on Monday next at the Mansion House, London. His subject will be the Surgery of the Œsophagus and Lungs. It is announced that the Society's annual dinner will be held on Thursday, Feb. 14th, at the May Fair Hotel, Berkeley-square, W.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XVIII.—THE INTERPRETATION OF THE WASSERMANN REACTION IN CHILDREN.

Taking of the Blood from Children for the Test.

IF the Wassermann reaction alone is to be tested 1 c.cm. or even less of blood will suffice, but if it be thought desirable to carry out in addition any of the "flocculation" tests, which will be referred to later, 3 or 5 c.cm. of blood will be necessary. Although in hospital practice and to a skilled pathologist with adequate assistance the taking of blood, even from the youngest infant, rarely presents any difficulty, it is usually inadvisable for various reasons for the practitioner to take the blood himself; it is wiser to allow a pathologist to do so.

The first essential is to have a good syringe, and this should be an all-glass syringe and not a "Record" glass and metal syringe, for with the latter the piston is apt to move stiffly. For many years I have used the three-piece all-glass "Agla" syringes made by Burroughs Wellcome and Co., which are very smooth in action. A 1 c.cm., 3 c.cm., or 5 c.cm. syringe may be used according to the amount of blood required, which is best obtained by vein puncture. From infants under 12 months in whom the anterior fontanelle is still open. the blood can be obtained quite easily from the longitudinal sinus by puncturing the fontanelle at its posterior angle. I have obtained blood from infants in this manner many hundreds of times, usually without any difficulty (except in cases of marked hydrocephalus when the landmarks are apt to be wanting), and with no ill-effects to the patients, and once the initial diffidence has been overcome this method of obtaining blood from infants will always be adopted. Other veins which are also selected for puncture are the anterior cubital vein, such as is used in adults, the external jugular vein, and one of the scalp veins. If no syringe is available, or if for any reason it be thought undesirable to puncture a vein, sufficient blood for the Wassermann test (½–1 c.cm.) may sometimes be obtained by puncturing the heel, big toe, or possibly the thumb or ear with a needle or glass pricker, but personally I never use or recommend this method, as it is more irksome to the patient, takes longer, and very often fails. The syringe used should either be dry sterilised or have been boiled in water and then washed through with normal saline, by aspirating this through the needle and then emptying the syringe. On no account should ether, alcohol, or methylated spirit or other antiseptic be present in the needle or syringe, because the admixture of any of these with the blood spoils the blood for the test. If the syringe, after having been boiled, is not washed out with saline, the small amount of water left in the syringe leads to hæmolysis of the blood. When the requisite amount of blood has been obtained in the syringe the needle is withdrawn and a small pad of gauze or cotton-wool held on the puncture hole by the assistant, while the blood is pushed out into the tube in which it is to be sent to the pathologist. The blood should not be allowed to remain any appreciable time in the syringe; otherwise it may begin to clot and the piston will stick.

For practical and working purposes we may take it that, in this country and elsewhere outside the tropics, a *strongly positive* Wassermann reaction indicates syphilis. On the other hand, a negative Wassermann reaction does not necessarily contra-indicate syphilis, though it may be correct in 90 per cent. of the cases.

Technique.

Without going into details of technique, we may recall the fact that some sera in the appropriate dilution, and in the presence of the appropriate antigen, are able to "fix" three minimal hæmolytic doses or units of complement; others can fix 5 units and are then said to have a stronger W.R. than the former; others, again, may fix the 5 units of complement with only half, one-quarter, one-eighth, or even less of the standard quantity of serum; such sera

would be regarded as having progressively stronger Wassermann reactions. The "indicator" which is used to show the presence or absence of unfixed complement is called a "hæmolytic system," and consists of a standard mixture of an emulsion of sheep's red cells and sheep's-cell hæmolytic serum, which has been heated to destroy its natural complement.

After preliminary titration of all the reagents, the first stage of the actual test consists of mixing together definite amounts of: (1) the patient's serum, previously heated to destroy its natural complement; (2) dilution of antigen extract, and (3) complement in guinea-pig's serum (3 and/or 5 units). The whole is made up to a definite volume and kept for half an hour at room temperature and then for half an hour in the water-bath at 37·5° C.

In the second stage equal volumes of the "hæmolytic system" are added to every tube, and after vigorous shaking the whole is incubated at 37·5° and examined after 5, 10, and 15 minutes, and read at the end of half an hour. If the corpuscles are completely dissolved and hæmolysed it is because the complement at the end of stage 1 has been free and not mixed, and such a reaction is called a (clear) negative. If the corpuscles are not completely dissolved after the water-bath the tubes should be kept overnight in the ice-chest to allow the corpuscles to subside and the next morning the reaction can be read off and the relative amount of residual corpuscles estimated.

The Report.

If the supernatant liquid is quite colourless it is obvious that none of the sheep's cells has been dissolved; in others words, the whole of the complement added in stage 1 has been fixed and the reaction is called a positive one, expressing the complete absence of hæmolysis by the figure 4. If half the corpuscles are hæmolysed the figure 2 is used, if less than half the figure 3, and if more than half the figure 1, so that for any one tube of the test one of the figures 4, 3, 2, 1, or 0 could be used to represent the result of the test in that tube.

In cases which are likely to be syphilitic, as well as in those which are known to be syphilitic and are undergoing treatment, it is advisable to use two different strengths of serum and also 3 and 5 units of complement for the Wassermann test. If such a serum were very strongly positive there would be no hæmolysis in any of the test-tubes and the result would be expressed by the figures 4, 4, 4, 4; if the blood were less strongly positive and there was complete hæmolysis with the smaller volume of serum (1 in 30 dilution) and 5 units of complement the reading of the result would be 4, 4, 4, 0.* A blood giving a reading of, say, 3, 2, 1, 1 would be regarded as a weak or partial positive.

Other Methods of Reporting on the Wassermann Reaction.

The method of reporting on the Wassermann reaction which has just been described is one which I have used for many years and which is also adopted by some other pathologists. It must be pointed out, however, that some years ago the Ministry of Health suggested a somewhat different notation for Wassermann reports, the symbols recommended being ++, +, ±, and −.

Thus ++ signifies a strongly positive Wassermann reaction, or a sigma test (vide infra), giving more than 3·9 units in 20 hours. This corresponds to the ++++ of some pathologists and to my 4, 4, 4, 4; + means a positive Wassermann reaction with fixation of the standard amount of complement, or a sigma test giving 1·5 to 3·9 units in 20 hours. This corresponds to the ++ of some pathologists and to my 4, 4, 0, 0; ± means a doubtful Wassermann reaction, with some hæmolysis in the standard tube, or a sigma test giving 1 to 1·4 units in 20 hours. Some pathologists would express this as ± ±, and with my notation it would be 2, 1, 0, 0; − signifies a negative Wassermann reaction or a sigma test giving less than 1 unit in 20 hours.

Formerly practically every pathologist had his own method of performing the Wassermann test, though the underlying principles were the same in most methods. In a test requiring the use of so many reagents of a "biological" nature, it followed that unless a more or less standardised method of titrating the reagents were employed, and further, that such standardised reagents were used in a prescribed manner, the results obtained by different pathologists would hardly be comparable. In consequence, the subject of the technique of the Wassermann reaction was fully considered by a Committee of the Medical Research Council some years ago with the result that four approved methods of performing the test were decided upon, and one or other of these methods is now used in most laboratories in this country. Even so, and using the greatest care in standardising the reagents and in carrying out the test and controls, an experienced worker may find that one week the results may tend to come out rather on the positive side, another week rather on the negative side. This is hardly to be wondered at in view of the complicated nature of the reagents employed and the fact that the actual mechanism of interaction of these reagents is so little understood.

The Sigma and Kahn Reactions.

It was on account of these admittedly inherent and unexplained difficulties in the actual performance of the Wassermann tests that simpler tests for the detection of syphilis were sought and elaborated. As a result (1) the "flocculation" test of Sachs-Georgi, modified by Dreyer and Ward and called by them the "sigma" reaction; (2) the Kahn; (3) the Meinicke; and (4) the Vernes flocculation or precipitation tests were introduced. The principle underlying all these tests is the addition of a specially prepared antigen to the patient's serum; in the case of a syphilitic serum a coarse flocculation or precipitate is produced, whereas in a normal serum no such phenomenon is observed. The advantages of these tests are: (1) that only one reagent, the antigen, is required; (2) the test is easily carried out; (3) the results are quantitative; and (4) in treated cases these tests are more sensitive than the Wassermann reaction, for they may remain positive long after the Wassermann reaction has become negative, which may be an indication that further treatment of the patient is desirable to prevent a relapse.

In reporting upon the "sigma" reaction any result above 1·5 units at 20–22 hours is regarded as positive; 1·0 to 1·5 units at 20–22 hours is regarded as positive in known cases of syphilis; less than 1·0 unit at 20–22 hours is regarded as negative, but the incubation is continued 40–44 hours, and if more than 1 unit at the end of that period is regarded as positive in known cases of syphilis only.

The Significance of a Positive Reaction in Children.

In children, as in adults, the Wassermann reaction may be strongly positive (4, 4, 4, 4), positive (4, 3, 1, 0), weakly positive (3, 2, 1, 0), or negative (0, 0, 0, 0), and it will be advisable to consider the significance of these results at different age-periods. A strongly positive or positive Wassermann reaction in a child of any age indicates syphilis and the necessity for treatment, with the possible exception of an apparently healthy new-born child or an infant a few weeks old, whose syphilitic mother has a positive Wassermann reaction. It is stated by some authorities that the Wassermann substance may pass from mother to child so that the latter reacts positively for some weeks, and that afterwards if the child is healthy the reaction becomes and remains negative. Other authorities maintain that the Wassermann substance is unable to traverse the placenta and that a positive reaction in a child is an indication of a syphilitic infection in the child. Of course, if an infant at birth or shortly afterwards has snuffles or a rash, particularly of a vesicular or bullous character, and if its Wassermann reaction is positive, it certainly has syphilis and should be treated accordingly. It is advisable to obtain confirmatory

* I have elsewhere (THE LANCET, 1927, ii., 692; Brit. Jour. of Venereal Dis.) described in detail my nomenclature for reporting on the Wassermann reaction in blood and cerebro-spinal fluid.

evidence by examining the mother's blood, and—unless the infection is of long standing in the mother—one usually finds that her reaction is also positive.

When the children in a family in which a frank case of inherited syphilis has been detected are systematically examined one or more may be found with a positive Wassermann reaction, but with no symptoms or signs, except perhaps suggestive teeth. Such cases are to be regarded as latent inherited syphilitics and most, if not all, syphilologists recommend treatment to guard against the possibility of later manifestations of the inherited disease. My own practice for several years has been to treat these children with injections of arsenicals and with mercury iodide or bismuth preparations until the Wassermann reaction becomes negative and remains so. Hitherto I have not seen such a case relapse or develop signs of syphilis.

A Negative Wassermann Reaction.

A negative Wassermann reaction is not conclusive evidence against syphilis, though a repeated negative is probably correct in 90 per cent. of cases. It is well known, of course, that infants who are found to have obvious signs of inherited syphilis at the age of 2 or 3 months may have been quite healthy at birth and for weeks afterwards. If the blood is tested during the earlier weeks of life—that is, while the disease is incubating—the Wassermann reaction may be found negative, though at the age of 2, 3, or 4 months it may be positive. Cases, however, have been recorded in which the Wassermann reaction was negative, yet the child had obvious symptoms of inherited syphilis. Confirmatory evidence in such cases may be obtained from the examination of the mother's blood. For many years I have made it a practice to test the mother of every suspected child under 1 year, though it should be remembered that if the mother is again pregnant a positive Wassermann reaction may become temporarily negative, and the result therefore unreliable. If an infant has obvious clinical syphilis it should be treated for the disease *even though its Wassermann reaction is negative*, and the blood should be tested frequently, for the treatment may for a time provoke a positive reaction (the so-called Herxheimer reaction). Another point which should be borne in mind is that the Wassermann reaction may fluctuate—certainly in treated and probably in untreated cases—so that at one examination it may be negative and when repeated a month or two later it may be strongly positive. Blood tests in doubtful cases should be repeated at intervals of one and two months.

In older children and in young adolescents in whom the infection may be only slight or who may have had mild infantile symptoms and then no sign of the disease for many years the Wassermann reaction may be negative. In such cases the Kahn or other flocculation test may be found positive, and when the patient has been treated or given a "provocative" injection of "914" the Wassermann reaction may become positive.

Weakly Positive Reactions.

It is sometimes stated that in inherited syphilis the Wassermann reaction is nearly always strongly positive, so that a negative or weak reaction may be regarded as evidence against the disease. I believe that to be wrong and I never ignore a weakly positive reaction. In my opinion it is an indication for further investigation in various directions: (1) examination of the patient for signs of the disease; (2) a provocative injection of "914" followed by examination of the blood 2, 7, and 14 days afterwards for the Wassermann and Kahn reactions; (3) investigation of the patient's early history for possible infantile symptoms; (4) inquiries into the mother's obstetric history; and (5) examination of the mother's blood, also that of the patient's brothers and sisters and of their blood reactions. In these various ways I have several times been able to demonstrate that a patient with a weak Wassermann reaction was really syphilitic.

The Wassermann Reaction after Treatment.

In a chronic disease like syphilis it is very difficult to say when a cure has been effected. The disappearance of the symptoms and the general amelioration of the patient's physical condition are important signs of cure, but it may be several years after the cessation of active treatment before one can feel reasonably certain that the patient is cured. Interstitial keratitis is apparently the least amenable to treatment of all the manifestations of inherited syphilis, and I have seen it occur in children who were actually undergoing treatment and on one or two occasions in children who had had several courses of injections and whose Wassermann reaction had already become negative. We see therefore that a negative Wassermann reaction cannot be regarded as conclusive evidence of cure, though the aim of treatment is, in addition to ridding the patient of his syphilitic symptoms, to render the Wassermann reaction permanently negative. For several years I have done the Kahn test in addition to the Wassermann reaction on my treated syphilitic children, and the treatment is continued until the Kahn test as well as the Wassermann reaction is negative. As many as 40 or even 50 injections of arsenic may be required—and one usually finds it is the older children (5 to 10 years of age) who require the longer courses of treatment. As a rule they remain negative, but a small proportion of them relapse serologically, though their general health remains good. A certain proportion of cases—perhaps 10 per cent. of syphilitic children over 1 year of age—remain strongly Wassermann positive even after full courses of treatment, and these comprise cases of congenital neurosyphilis in which the Wassermann reaction in the spinal fluid is found to be strongly positive, cases of ulceration of the palate, naso-pharynx, or larynx, and more rarely cases with periostitis or other manifestation of the inherited disease. The spinal fluid should always be examined in these cases with persistently positive Wassermann reactions, and if it too be found positive malaria therapy should be tried either alone or combined with intrathecal injections of salvarsanised serum, for, so long as the spinal fluid is positive, the possible development of general paralysis or other syphilitic cerebro-spinal disease is not excluded. In the absence of evidence of disease in the central nervous system, and if the patient has had full courses of treatment with arsenic and bismuth and appears well, I have suspended further treatment, and have found that in some cases the Wassermann reaction some years afterwards has become less strongly positive or even negative.

What to Tell the Parents.

Having established the diagnosis of syphilis in mother and child it is in my opinion advisable to be frank with the mother and to tell her that the child is suffering from a "blood" disease which it has inherited from its parents and that a long course of treatment is necessary in the interest of the child's future health and well-being. If any apathy or even antagonism is manifested by the parents one can point out that the child is the innocent victim of disease in its forbears and that it is the duty of its parents to see that it receives proper treatment *at once*, as an insurance against possible future disablement. The parents should also be advised to undergo treatment to avoid the risk of a future breakdown in health which may render one or both of them unfit to provide for their children. I have come across at least a dozen families in which the syphilitic child has been the third generation to suffer from the disease, and from careful investigation in possible third generation cases I conclude that such instances may be more numerous than is generally believed. When a mother asks me how her child can have contracted the disease I tell her that it is quite possible for her to have inherited the disease herself and to have passed it on to her child; also, that the husband may be quite free from infection, and under the existing conditions he cannot be infected by his wife. Even

when I disclose the actual nature of the disease to the parents—as it is sometimes necessary to do to induce them to bring the child for treatment or to continue to do so, in case of their default—I have never had any domestic difficulties when I have explained how one or other parent may have inherited the disease from the child's grandparents and passed it on to the child.

In view of the fact that the treatment and subsequent supervision of the patient is likely to be very prolonged—extending, as it should, over many years—and that the parents' willing coöperation is necessary, one should always be conciliatory and sympathetic with the parents, yet sufficiently firm when they fail to bring the child for treatment to make them realise their responsibility for its present and future welfare.

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Special Articles.

THE LATE CONSTANTINOPLE BOARD OF HEALTH.

A SUPPLEMENTARY NOTE.

BY F. G. CLEMOW, C.M.G., M.D., D.P.H.,
FORMER BRITISH DELEGATE TO THE BOARD.

IN three earlier papers that appeared in the columns of THE LANCET in the summer of 1923[1] I gave a short account of the origin and history of the late Constantinople Board of Health. In the interval that has since elapsed further research into the surviving records of the time—notably the *procès verbaux* and other archives of the Board itself and the official correspondence relating to matters dealt with by the Board—has thrown much fresh light on the subject; and the new material thus acquired appears to be of such interest that I may perhaps be permitted to supplement those articles by some additional notes; to correct one erroneous statement; and to relate, quite briefly, how the affairs of the Board have been finally wound up and disposed of.

It was stated in the opening paper that, while 1839 had not infrequently been given as the date of the Board's coming into existence, some form of mixed Sanitary Council was unquestionably sitting in Constantinople at least as early as 1838, while the Turks themselves claim that, on the occasion of the great cholera epidemic of 1819, some kind of quarantine was applied to ships arriving in the Bosphorus, and that in 1836 a Turkish Quarantine Board, composed of three members, was already in existence. It has not proved possible to find positive confirmation of this latter statement, but it is quite possible that the Turkish claim is a just one, for already some years before that date there had been a moving of the waters in Turkey in the matter of protective quarantines. It was an era of great reforms in that country. The reigning Sultan, Mahmud II, had done more than any of his predecessors to abolish abuses, encourage progress, and introduce into a backward country the ways and methods of western civilisation. He had destroyed the Janissaries in 1826; he entirely reorganised the military and financial administrations; he suppressed those tyrannous local hereditary chiefs, known as the Deré Beys; and brought about many other reforms. And now he was desirous that Turkey, which was so specially liable to the ravages of plague and other pestilential diseases, should adopt those measures of protection that had long been practised by other and more advanced countries. His efforts to attain this end, however, met with no little opposition—both from his own people, whose fatalistic outlook on life could see in such measures nothing but a flouting of the Divine will, and from the foreign nations, who feared that those same measures, as applied in Turkey, would mean nothing but disastrous delays, cost and vexation for their shipping and commerce. But the Sultan was determined to overcome all such obstacles, and the successive steps in the process are of sufficient interest to be told in some detail.

As early as 1831 a request was addressed to the British Ambassador, asking him to procure "a plan of a lazaretto, to be established in Turkey, on European principles." Writing a few years later,[2] the Chaplain to the Embassy says:—

"The next conquest over religious prejudices was taking precautions against the plague. They had carried conviction of its sinfulness to such an extent that, in the year 1812, when the disorder ravaged the city [of Constantinople], they would not suffer prayers to be offered up in the mosques to stay it, till 1000 persons were carried daily out of the Top Kapousi Gate to be buried, deeming even that a murmuring against Providence and a want of due submission to its decrees.[3] But after the late Russian campaign they began seriously to consider the absurdity of those opinions, and attend to the regulations enjoined by the Sultan. An energetic pasha, seeing the plague break out in his district, drew a cordon round a village where it was reigning, and suffered no one to pass in or out of it on any pretence. After some time everything was silent, and on examination it was found that the whole population was dead in their houses, but the disease never extended beyond the spot where this frightful precautionary sacrifice was made.

"Availing himself of the impression which these and similar occurrences had made on the people, the Sultan caused application to be made to the British Minister at Constantinople for a plan of a lazaretto to be established in Turkey on European principles, with a view to prevent the introduction of the disease. This application was despatched to England, and orders were sent to Malta that a plan of the lazaretto of that place should be forwarded to the Turkish Government. This institution, however, was liable to many objections. It had been erected by the knights at a time when the island had no commerce, and when the thing was imperfectly understood, so it was determined to draw up a plan on the most improved system, in which all that was excellent should be embodied. The direction of the whole was given to Captain Schembri, a native of Malta, who had been particularly active and efficient when the plague had ravaged the island in 1813 and had continued to superintend the quarantine for 20 years since that period. With this intelligent man and on his benevolent mission I sailed," continues the Chaplain, "from Malta and we arrived at Pera on May 1st, 1831. His plan was submitted to the Sultan and highly approved of. It embraced the establishment of quarantine offices and lazarettos on the Dardanelles and Bosphorus, and all the towns on the coasts of Asia and Europe, with a board of health to organise a sanatory police, to watch the introduction and appearance of the disease, and take immediate precautions. The lazaret to be built for the capital is intended to be a noble edifice, 700 feet in length, in an airy and pleasant situation on the shores of the Bosphorus, and on such a plan that it will present to the view an elegant and cheerful abode, calculated rather to inspire pleasing thoughts than those dismal and depressing reflections, excited by other gloomy lazarettos, which, by sinking the mind, predispose the body to any complaint. The expense of the establishment is estimated at £20,000. When this is finished it will probably be the completest institution of the kind that ever was in the world, and it is not impossible that European nations may hereafter adopt this quarantine establishment of the Sultan for their model, and so take their plans for the future prevention of the plague from a people who for centuries obstinately persisted in allowing no precautions to be taken. The value of this important innovation will be appreciated, by considering that the European nations have drawn a vast cordon of perhaps 10,000 miles by sea and land round the Turkish Empire, forming a barrier through which no one is allowed immediately to pass, under penalty

[1] THE LANCET, 1923, i., 1074, 1126, and 1180.

[2] A Residence at Constantinople. By the Rev. R. Walsh, LL.D. London, 1836. Vol. II., Chap. XI.

[3] Such fatalism was not confined to Turks, nor to Moslems. Dr. Grassi, of Alexandria, wrote in 1839 of the "fanaticism of the Abyssinians (both Moslems and Christians)." They regarded the plague, he says, "as a beneficent emanation of the Divinity, which not only ought not to be avoided, but which every person ought to procure, and fix upon himself, as a means of salvation in a future state." And he relates how, when plague was raging in Jerusalem in 1838, a Copt caught the disease and died. There were 17 Coptic monks in that city—all "threw themselves with eagerness on the death-bed and clothed themselves in the garments of the defunct. All 17 perished."

of death; but when precautions similar to those of Europe are adopted in this country also, the Turks will no longer be an excluded people, but the intercourse will become as free as between one European nation and another, a great obstacle will thus be removed to their amalgamation with us, and they will no longer continue to be a distinct and separate people."

These grandiose conceptions, which even to-day can only be read with admiration, were destined to be but partially realised. The great lazaret on the Bosphorus, that was to be a model to other nations, remained a dream of Alnaschar. But the "board of health," the quarantine offices and lazarets around the coasts of Asiatic and European Turkey did in time come into existence. The Board of Health, indeed, was formed at the latest some seven years after these great reforms were foreshadowed, and, as was stated above, it is quite possible that some sort of board may have already existed, as the Turks claim, as early as 1836.

Early Projects for Quarantine.

A year earlier it would appear that, whether there was then any central quarantine authority or not, local authorities were already, on their own initiative, arranging to set up quarantine in their districts, with the agreement and coöperation of the foreign consular representatives. Thus, on Dec. 19th, 1835, the Governor of Prévesa, Saly Agha, came to an agreement with the British, French, and Greek consuls for the adoption of a set of quarantine regulations to be applied in that port. Under these rules a remarkable degree of power was given to the three consuls named. All ships of the nations they represented, coming from a plague-infected or plague-suspected place, were to submit to such precautions as might from time to time be decreed by the three consuls. Ships of any other Power were to put themselves either under the protection of one of the consuls or under the jurisdiction of the Customs authorities, who "shall be held to conform strictly to the orders" issued by the consuls. Penalties were to be imposed on persons breaking the rules, and the "Primate of Prévesa" was to nominate four health officers, "who shall be required, on entering upon their functions, to make oath for the due performance of the same." Their pay was the princely sum of six piastres (1*s.*) a day—this and their maintenance to be at the charge of the ship.

In like manner we find that, in September, 1837, the consuls of the chief European Powers at the Dardanelles were invited to meet the Pasha-Governor to discuss the best method of carrying out the desire of the Sublime Porte to establish quarantine in those straits. The proposals put forward by the Pasha, on instructions from the Porte, are of exceptional interest. They were not only remarkably reasonable for the time, but—apart from the quarantine, the duration of which does not appear from the surviving correspondence of the period—were in striking harmony with the principles of present-day practice and of the latest International Sanitary Conventions. Thus it was proposed to put a quarantine upon all ships arriving at the Dardanelles from any place where plague existed; boats were to be sent off to each ship as it arrived, "on the part of the Pasha, as chief of the Quarantine Department, to make inquiry respecting the health of the crew, the particulars of the voyage, and the nature of the cargo, and to demand, if necesary, the ship's papers; also *to note down the names of all the passengers, a list of whom is to be sent to Constantinople.*"[4]

It may reasonably be assumed that the object of this last regulation was to enable the Constantinople authorities to keep the passengers under some form of sanitary or medical supervision after their arrival in that city; and if that assumption is correct, it may be asserted that these Turkish proposals of 1837 clearly foreshadowed the modern practice of "surveillance" (as distinguished from "observation").[5] That practice was first prescribed in an International Sanitary Convention by that of Dresden, 1893, though it had been adopted in England some years before that date.

In spite of their reasonable character, however, the Turkish proposals met with opposition from some of the foreign consuls, and seem to have been dropped. For, writing in November, the British Ambassador in Constantinople states that so far nothing had been done by the Sublime Porte towards setting up the proposed quarantine, adding: "The Ottoman Commissioner who was sent there is dead and no regulations whatever have been made."

In another part of the Turkish realms—the Regency of Tripoli—quarantines and a local Board of Health were already in existence, it would seem, long before 1838. This is shown by a Note addressed by the foreign consuls in Tripoli to the Pasha Governor urging him to establish—

"a well-regulated and efficient quarantine and board of health, upon the same principles which so long existed here and which so effectually preserved the health of the Regency when it was confided to the direction of the Consular corps, with the concurrence of the chief authority of the Regency."[6]

Then, again, we find Prince Metternich, in Austria's reply to the French (unsuccessful) proposal to convoke an International Sanitary Conference in 1838, writing as follows:—

"For the last six years sanitary establishments have existed on the left bank of the Lower Danube, and these have entirely succeeded in preserving Wallachia and Moldavia from the invasion of plague."[7]

It is of interest also to note that the same authority in the same letter, wrote:—

"Lastly, Sultan Mahmoud, who is so disposed to enable the people subject to his sceptre to participate in the benefits of European civilisation, has not only recently manifested, by several publications, his firm determination to introduce quarantine into Turkey, but has even lately applied to us for several persons employed in our Quarantines (who were granted to him immediately)[8] in order that the Commission of Public Health instituted at Constantinople, assisted by their counsels, and by long experience, may be guided in the adoption of sanitary measures."

The "Commission of Public Health instituted at Constantinople" can scarcely have been other than the new Constantinople Board of Health, which was thus clearly in existence as early as 1838. Elsewhere, too, Turkish lazarets were already in being in that year, for on July 11th H.M. Consul in Salonika reported as follows:—

"A spacious building has been engaged for a lazaret for all persons and goods arriving by sea from infected ports, and other lazarets have been established for travellers and merchandise from the interior. Turkish Government tatars and couriers, arriving by steamboat from Constantinople and Smyrna, are put into quarantine, and the dispatches forwarded after fumigation, by other tatars from this."

In October, 1838, moreover, quarantine regulations were already being applied at Trebizond. The British Consul there reported that persons from the interior were subjected to three days' quarantine before being allowed to enter the town, and those who wished to embark on vessels had to do 15 days' quarantine in a lazaret. And in December of the same year a report was received from the British Consul in Candia

[4] Report of Mr. Lander, Consul at the Dardanelles, Sept. 4th, 1837. The italics are not in the original.

[5] The two terms were first clearly defined in a footnote to the Venice Convention of 1897—footnote which, with slight modifications, reappears in the Conventions of Paris (1903) and Paris (1912) in the following form: "The word *observation* signifies: isolation of passengers, either on board a ship or in a lazaret before they obtain free pratique." "The word *surveillance* signifies that the passengers are not isolated, that they obtain free pratique immediately, but they are followed up in the various places to which they are going and subjected there to a medical examination to determine their state of health." This medical visit is repeated daily as long as the "surveillance" lasts.

[6] Correspondence Relating to the Contagion of Plague and the Quarantine Regulations in Foreign Countries, 1836–43. Presented to the House of Commons, 1843.

[7] Ibid.

[8] Among these Austrian advisers was Dr. Minas, who had been head of the Quarantine establishment at Semlin, on the Danube. He arrived in Constantinople in July, 1838. (Proust: "La Défense de l'Euro e contre le Choléra.")

relating to certain proposed alterations in the quarantine law there—expression that implies that some form of quarantine regulations were already in existence.

I should like to take this opportunity to correct one statement that appeared in the earlier articles on this subject. It was there asserted that the Board

"was originally a local body, brought into existence to meet the immediate menace of a plague epidemic, and limiting its aims mainly, if not entirely, to the protection of the Turkish capital. It only later extended its work to the protection of the other ports and frontiers of the Turkish Empire and gradually assumed the many other responsibilities that fell to it during the later decades of its existence."

This, in the light of more recently acquired knowledge, is seen to be erroneous. From the very first the Board did not confine its work to the capital or its neighbourhood, but extended it to other, and far distant, ports and frontiers of the Turkish Empire. Moreover, as has just been shown, in some of the outlying portions of that empire quarantine regulations already existed and were applied even before the Board came into being.

Difficulties with the Sublime Porte.

Reference was made in the earlier articles to a critical moment in the Board's history, when its action met with the disapproval of the reigning Sultan, and

"the latter threatened to swamp it by the nomination of a large number of Turkish members, sufficient to outvote the foreign element on the Board—a threat analogous to that made a few years ago to a more august body in this country."

From the minutes of the Board the following additional details may be gathered. The incident occurred in the summer of 1884. Cholera was prevalent in France, and particularly in Marseilles. The Board had imposed a ten days' quarantine on arrivals in Turkey from French ports. An *iradé* was issued by the Sultan, demanding that some quarantine be also imposed against Varna and other Black Sea ports, on the grounds that passengers might come overland from France to those ports. The Board therefore imposed five days' quarantine and disinfection on arrivals from Varna, Kustenjé, the Danube ports, and Odessa. But even this was not deemed sufficient, and still severer measures were demanded; it would seem also that orders were given, behind the Board's back, to apply such severer measures by the customs and military authorities. The Board protested and refused to recognise these measures or to increase those it had already itself decreed. Thereupon, a fresh *iradé* was issued, nominating seven Turkish doctors as "honorary permanent members" of the Board; these were selected from the highest medical officers in the Turkish civil and military services. The foreign delegates, however, refused to sit with them, and the first and only meeting at which they were—not present, but waiting in rooms adjoining the council chamber—was brought hurriedly to a close. The Board did not meet again for a fortnight (it usually held weekly meetings), and in the interval the matter seems to have been smoothed over for a time and the seven additional members withdrawn.

But a month later, on Sept. 16th, the attack was renewed. The Board had decreed ten days' quarantine against Mediterranean ports and five days against Black Sea ports, on account of the very severe cholera epidemic then raging in Naples. The Porte was again dissatisfied, and the Council of Ministers decided that the Board should be required to discuss the question of increasing the measures jointly with the same seven "honorary members" as before. The decision was further sanctioned by an Imperial *iradé* to the same effect. Once more, however, the foreign delegates protested, and this time, as the minutes show, the Board held no meeting for three weeks; when it met again, the incident had apparently once more been smoothed over and the seven additional members again withdrawn.

The Constantinople Board of Health: Exterior.

The incident well illustrates what was one of the frequent difficulties with which the Board had to contend. When it had first been brought into being, some European Powers were apprehensive lest it should tend to apply over-long quarantines and other excessively restrictive measures, which, it was feared, would only hamper shipping and trade without offering compensating advantages from the public health point of view. These fears, however, had not been realised and, in the majority of instances, the Board's decisions were more or less moderate and in accordance with the professional views current at the time, and were only occasionally reactionary and inspired by the alarm of the moment. But for a great part of its existence, and especially during the long reign of Abdul Hamid, the tendency frequently manifested by the Board—and particularly by the foreign delegates—to rely rather upon modern sanitary measures than upon lengthy quarantines was constantly met by opposition or active interference from the Palace. *Iradé* after *iradé* would be promulgated, demanding longer quarantines or stricter measures than the Board thought necessary to meet a given set of circumstances, and not infrequently a compromise would be arrived at, by the Board decreeing

measures somewhat more severe than those it had already imposed, but somewhat less severe than those demanded by the Palace. As a corollary to this state of affairs, the Board not infrequently decreed in the first instance more stringent measures than it would otherwise have done, in order to forestall Palace interference.

The Final Chapter.

The final chapter in the long history of the Board can be told quite briefly. A short section of the Treaty of Lausanne (1923) dealt with the matter. It was there formally recognised that the Board had ceased to exist as an international body, and the Turkish administration was charged with the sanitary defences of the coasts and frontiers of the greatly diminished Turkish State. It also provided, in the following article, that a Special Commission should meet in Constantinople, in order to liquidate completely all outstanding matters relating to the former organisation :—

Art. 116.—Turkey undertakes to respect to the full the rights of dismissed sanitary employees to an indemnity to be paid out of the funds of the ex-Superior Board of Health of Constantinople, and all other established rights of the employees and ex-employees of that Board and their heirs or representatives ("ayants droit"). All questions relating to those rights, to the destination to be given to the reserve funds of the ex-Superior Board of Health of Constantinople, to the definite liquidation of the former sanitary administration, as also any other similar or connected question, will be settled by a Commission *ad hoc*, composed of one representative of each of the Powers who formerly took part in the Superior Board of Health of Constantinople, with the exception of Germany, Austria, and Hungary. In case of disagreement among the members of this Commission on any question concerning either the above-named liquidation or the affectation of the residue of funds remaining after the liquidation, any Power represented on the Commission will have right to refer the matter to ("d'en saisir") the League of Nations, who will give the final decision.

Other clauses provided that one and the same sanitary tariff must be applied to Turkish and foreign shipping and nationals,[8] and dealt with some other minor matters.

The Liquidation Commission set up by the above article came together in Constantinople in February, 1925, and sat until June, 1926. Its task was one of considerable complexity, and was not rendered easier by the fact that large numbers of the persons to be liquidated were living in distant territories (such as Mesopotamia, Syria, Palestine, Arabia, and so forth) now detached from the former Turkish Empire, or were scattered in different countries of Europe, Africa, Asia, and even America. Its main tasks were to examine the large number (over 500) of claims and requests addressed to it either by former employees or by other persons not connected with the administration ; to compensate former officials and employees for the loss of their posts and the ruin of their careers ; to commute the pensions of sanitary pensioners ; and to dispose of the considerable reserve funds accumulated by the former Board in such a way as to satisfy, so far as might be, the often conflicting claims of the persons just named and those of the Turkish Government and present Turkish sanitary administration.

How far the Commission succeeded in satisfying either those claims or the claims of abstract justice will no doubt always be a matter of difference of opinion among the opposing claimants ; but, as British delegate and secretary-general to the Commission, I am in a position to assert that no effort was spared to arrive at a just and equitable distribution of the large funds that the Commission was called upon to administer, and that, in my opinion, the results arrived at did, on the whole, attain a very high level of justice and equity.

PS.—The accompanying illustration shows the exterior of the Constantinople Board of Health, as it was before the war, and as it still is. It continues to house the (purely Turkish) administration that now looks after the sanitary defences of the diminished Turkish State. The structure itself is of no great age, having been built—or rebuilt—some 30 to 35 years ago, when an earlier edifice had been badly damaged by a severe earthquake. Both buildings were erected over a curious underground, crypt-like structure, of considerable area, which has for long been used as a Moslem mosque. Its history is unknown, but it is believed to have existed from quite early times, possibly dating from the Byzantine era.

[8] The necessity of some such clause had been demonstrated by the fact that, in the autumn of 1922, when Turkey took repossession of the sanitary and other administrations in Constantinople, she at once imposed a preferential sanitary tariff, under which Turkish ships paid two, and foreign ships five, piastres per ton for sanitary dues.

THE HEALTH OF THE SCHOOL-CHILD.

ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER TO THE BOARD OF EDUCATION FOR 1927.[1]

IN his report Sir George Newman points out that about 2,000,000 children are inspected every year, a work which occupies some 2000 doctors, 600 dentists, and nearly 5000 nurses. The first object of the service is the ascertainment and effective treatment of the ailing child and the system involves careful examination of each individual, patient follow-up work, the provision of treatment and after-care, and the adaptation of the educational system to the needs and capacity of the subnormal child.

The figures for 1927 are impressive. Of the 4,967,394 children in average attendance at school 36·7 per cent. were medically examined, an increase of 219·8 on the preceding year. In addition 861,964 were examined as "special cases," bringing the total to 2,685,739, or 54·1 per cent., of the number in average attendance ; 1,719,844 re-examinations were made, an increase of 5 per cent. on the year before. This figure expresses the increasing extent to which school medical officers are criticising the results of treatment to ensure that maximum benefit is obtained. It is recognised that no medical service can be completely adequate unless it provides for continuous medical supervision. Of the 1252 school medical officers, 269 are whole-time, 600 divide their whole time between school and public health work, and 383 are part-time officers ; 449 undertake specialist work ; ophthalmic, aural, anæsthetic, X ray, and orthopædic services occupy 872 part-time and 16 whole-time specialists, and the private practitioner is said to be rendering valuable service. 282 of the school medical officers are women.

Every year about one-fifth of the children examined by routine are found to need some medical treatment, apart from dental disease. Defects of eyesight and enlarged tonsils and adenoids each account for about one-third of the total sum of defects. The number of the children notified in the latter group shows a distinct increase, but otherwise there has been a very slight general decrease in the numbers referred for treatment, and a notable one in the numbers suffering from severe malnutrition. The incidence of defects, other than defective vision, is about 19·5 per cent. in the entrant group and 11 per cent. in the school-leaver group. Some figures, given by the school medical officer for Liverpool, show that the 5-year-old child is approximately half an inch taller and over a pound heavier than he was six years ago, and that the leaver is more than an inch taller and over four pounds heavier than in 1921. Similar figures are recorded from other towns, and the diminished number of children reported as chronically absent from school is another proof of the improving health of the child population. There is also steady progress towards cleanliness ; the numbers of individual

[1] H.M. Stationery Office. 1928. Pp. 204. 1*s.* 6*d.*

children found unclean were: in 1924, 7·4 per cent.; in 1925, 6·5 per cent.; in 1926, 6·4 per cent.; and in 1927, 5·6 per cent.

Development of Treatment Schemes.

It is gratifying to learn that local education authorities are on the whole fully alive to the needs of the children under their control, although financial considerations still hamper the extension of facilities. The most notable advance during 1927 was the extension of orthopædic treatment. New schemes have been approved in 28 areas, bringing the total number to 160. Twenty-six areas instituted artificial light treatment and 56 new specialist officers were appointed, including 33 new dentists and 12 orthopædic surgeons. The school clinics are increasing rapidly; in 1910 there were 30 of them and now there are 1520. Of these, 936 deal with minor ailments, 1039 with dental defects, 569 with visual defects, 80 with enlarged tonsils and adenoids, and 150 with orthopædic defects, while 45 treat ringworm with X rays and 26 supply artificial light treatment. The attendances at these clinics fully justifies their extension; in 1914 it was 123,039; last year it had risen to 663,305.

About 10 per cent. of all children need visual correction, and during 1927 eight additional ophthalmic specialists and 15 new ophthalmic clinics were provided. Good results in the treatment of squint are reported from several districts. The incidence of enlarged tonsils and adenoids is about 5–6 per cent. among unselected school-children, and the causes are still obscure, though it seems probable that they are nutritional rather than environmental. Treatment is now provided at 461 hospitals and 80 school clinics, the total number of children operated on being 80,548—about half of those referred for treatment. For chronic nasal catarrh diastolisation is being tried in Liverpool and London and is giving encouraging results. The essence of this treatment is massage of the nasal passages by soft inflatable rubber bougies. It is said to be particularly well adapted to the relief of those conditions resulting from inability to breathe correctly. Ionisation is now in use by 40 local authorities for otorrhœa; the operative treatment of mastoid disease is undertaken by 32, and other special forms of aural treatment by 31. The incidence of dental disease varies little; in 1927 it was found in 64·6 per cent. of "routine" cases. This does not mean that the treatment provided is without value, for the number of unsaveable permanent teeth diminishes year by year.

The Board are seeking detailed records of the effect of artificial light treatment, but so far little material is available. General inferences show that there is almost universal agreement as to the tonic value of light on tired and languid children, but the evidence for specific effect on particular ailments is conflicting or indefinite, and on the whole negative. The prevention of crippling demands the efficient working of a comprehensive scheme, such as is described from Lancashire. Birmingham found that 84·5 per cent. of non-tuberculous crippling occurred before school age. Delay means longer treatment at greater cost with worse prognosis. Increasing attention is being given to the treatment of postural defects in special clinics.

Nursery Schools and Special Schools.

The increasingly significant problem of the pre-school child is being dealt with in 27 centres at present by "nursery schools"—which resemble homes rather than schools. The aim of nursery schools is to prepare children from 2 to 5 years of age for their school life by providing them with abundance of light, air, and nourishing food, and training them in good habits. The distinction between work and play disappears; the children work when they think they are playing and play when they think they are working, all the while growing strong and cultivating an alert and receptive attitude of mind. The nursery school is an important factor in the correlation of infant welfare work and school medical service.

Evening play centres now number 273, with an average total attendance of 59,000. Several new open-air schools have been opened, and the special educational needs of the children who attend them has received careful attention. The curriculum, while it is less formal than that of the ordinary school and perhaps covers a smaller superficial area, yet has greater depth and is experimental, practical, and intuitive. Playground classes in ordinary schools are also being encouraged in many districts and much improvement in intelligence and alertness has been noted as a consequence. Two new special schools for mental defectives have been opened and two more are projected; the number of mental defectives ascertained during 1927 was 33,000. Through the activity of the Commonwealth Fund Dr. Ralph Crowley, the Board of Education's senior medical officer, visited the child guidance clinics in America last autumn; at present London, Bath, and Stoke-on-Trent are the only areas where any clinic provision is made for the nervous or maladapted child of this country. There are six special residential schools for epileptic children, of whom 2652 were notified as unfit to attend school during 1927. The special schools can only provide for 525, and there is therefore grave need for further accommodation for this group. Classes for stammering children have been conducted in some 30 areas. Blind and partially blind children ascertained during the year numbered 1925 and 4929 respectively; the numbers have decreased considerably. The numbers of the deaf and partially deaf requiring special education were 6091. Their needs are the subject of a special article in the Report.

There seems to be considerable room for improvement in the standard of cleanliness, heating, and lighting in school buildings, and there are still too many obsolete desks. Defects of this kind go far to counteract the work done by the medical inspection and treatment, and call for vigorous and persistent action by the education authorities.

The Secondary School-child and the Young Worker.

The report shows that the health of the secondary school-child compares favourably with that of the elementary scholar, but fuller and more careful records are needed to estimate the relative importance of such factors as strain, extra-school environment, and age on the production of minor abnormalities, which are rather frequent. The elementary school-child, moreover, is improving physically at a greater rate than is the secondary school-child. Although the latter has better school premises, playing-fields, and often substantial mid-day meals, yet he has a longer journey to school very often, longer hours, more home-work, and less satisfactory facilities for the treatment of minor ailments. The remedies suggested are closer supervision of personal hygiene and careful attention to the suitability of the child for scholarship work and for the calling selected for him. The crucial question for the school medical service is whether or not the schools are turning out a better worker year by year, and there is evidence that the physique and health of the leaving child is improving steadily. Thereafter, however, he tends to go backward in health, and the Board is commendably exercised with the adolescent health of its ex-scholars. Education needs to be linked up with employment, just as infant welfare needs to be linked up with school. In many areas the juvenile employment bureau and juvenile advisory committee is in intimate coöperation with the education committee. The certifying factory surgeon, according to Sir George Newman, should also have access to school medical records, and there should be greater uniformity in the meshes of the various sieves through which a young person passes before being accepted for employment. Many private schemes of factory welfare bridge the gap of two years which the State

has left during the critical phase of adolescence. The report reviews a number of these, and looks forward to much more intimate coöperation between them and its own medical service, and to some scheme of the same kind which shall cover all adolescents who at present are no one's special care.

Health Education.

The chief medical officer expresses the opinion that the lack of effective teaching of hygiene is the weakest link in the whole chain of child welfare. The injuries due to ignorance should be prevented, and the study and practice of health should form, from the first, part of the everyday life of the school. Hygiene must not only be taught but must also be practised day by day; otherwise there is no momentum to carry the teaching through adolescence and adult life. Every teacher should bear in mind his direct responsibility in this matter to every individual child. The Board has recently published a special new "Handbook of Suggestions," to constitute a guide in the teaching and practice of hygiene, and regards a knowledge of its contents as part of the necessary equipment of every teacher. The Board is also anxious that girls should learn the first principles of mothercraft, for if they do not learn them at school they are unlikely to have any opportunity for organised teaching afterwards. In elementary schools the girls can visit local welfare centres or day nurseries; the secondary school-girl can approach the subject through elementary science.

Physical Training, School Meals, and Research.

Organised physical training has been a part of the school curriculum for 20 years, and admirable effects have been produced, but the work is still expanding. The Board has decided to advise local authorities to embark on a general reorganisation which will involve changes in the physical training, and this report therefore reviews rather fully what has been done and the proposed amendments. The provision of meals for school-children is increasing; nearly 16,000,000 meals were supplied in England and Wales during the year, half of them being dinners. The danger of turning this provision into an unauthorised kind of poor relief can only be met through medical certification and direction.

The list of research investigations made by school medical officers and special workers is a long one. The subjects studied include postural defects, goitre, infectious diseases, rheumatism, stammerers, backward children, tonsils and adenoids, ringworm, ventilation, and ultra-violet light. The Anthropometric Committee has continued its valuable work.

Conclusion.

The general conclusion formed by the chief medical officer is that, while there is as yet no sign of diminished incidence of the ordinary physical defects of school life, there is, nevertheless, evidence that the general physical condition, as shown by physique, health, nutrition, and cleanliness, tends steadily to improve. The school doctor has an important part to play in the medico-educational problems of the nation; he must keep his horizon wide, take a broad view of medicine, understand his affinities with the educationist and the psychologist, and thus play his proper rôle in the creation of the right school environment during the passage from childhood to adolescence. The report will encourage all who are collaborating in this great national scheme to persevere in their duties though these may seem arduous, dull, and sometimes unproductive. Sir George Newman points out that the routine work of the school medical officer has a vastly wider purpose than the collection of medical statistics and even the individual relief of the patient. It makes practicable a fuller education of the people as a whole, and is the prelude of national efficiency. In the audit and account of this work may be found a service of science and humanity which is silently but certainly changing the prospects and hopes of the English people.

MEDICINE AND THE LAW.

A Vinegar Prosecution.

THE last annual report of the Ministry of Health recorded the fact that 1553 samples of vinegar were taken under the Sale of Food and Drugs Acts during 1927; of these, 142 were found to be adulterated or not up to standard, chiefly by reason of the deficiency of acetic acid. The percentage seems unduly high; it works out at 9·1 as against a figure of 6·2 for 1926. In some cases vinegar sold as "malt vinegar" was found to be not brewed but artificial vinegar. A case has recently come before the Divisional Court which seems to indicate a disinclination on the part of magistrates to take a serious view of adulteration. A prosecution took place before the Atherstone bench on a charge of selling table vinegar which was 100 per cent. artificial. The magistrates, according to a summary of the case in the *Solicitors' Journal*, dismissed the summons on the several grounds that there was (*a*) no statutory standard of vinegar, (*b*) no evidence of guilty knowledge, and (*c*) no reason for imposing a penalty upon a defendant who had acted in good faith. The inspector appealed on the ground that the county analyst had proved that three grades of vinegar exist; but the appeal was countered by the plea that the magistrates had dismissed the case under the Probation of Offenders Act and that their decision could not now be disturbed. The Probation of Offenders Act was not apparently mentioned in the "case stated" which came before the Divisional Court; the fact was merely recorded that the magistrates dismissed the summons because no offence had been committed. The Lord Chief Justice observed that the allegation that the vinegar was 100 per cent. artificial was uncontradicted, and that, as the defendant called no evidence, the magistrates ought to have found the charge proved on the uncontradicted facts. The Divisional Court remitted the case to the magistrates with a direction to that effect. The result is somewhat obscure. If the magistrates were acting under Subsection 1 (1) of the Probation of Offenders Act, 1901 (as the defendant apparently contended on appeal), then they must already have considered the charge to be proved; otherwise they could not have acted under that particular enactment. The statute provides that, if the court of summary jurisdiction thinks that the charge is proved, but is of opinion that the character, antecedents, age, health or mental condition of the accused, or the trivial nature of the offence, or the existence of extenuating circumstances, make it inexpedient to inflict any punishment or any other than a nominal punishment, or to release the offender on probation, then the court may, *without proceeding to conviction*, either dismiss the charge or bind the accused over. The Divisional Court may give the Atherstone bench a strong hint of its opinion, but, if that bench is determined to operate the Probation of Offenders Act in this particular case, the magistrates can still dismiss the charge without proceeding to conviction. One result of sending the case back to them may be a little additional local publicity for the facts alleged in the summons. The Food and Drugs (Adulteration) Act, 1928, now in force, states the law perfectly clearly: "No person shall sell to the prejudice of the purchaser any article of food or any drug which is not of the nature, or not of the substance, or not of the quality, of the article demanded by the purchaser." If it is to be a defence that the law specifies no standard of what is vinegar (or any other article), the law had better be amended.

A Coroner's Dilemma.

Parliamentary draftsmen are probably not sanguine enough to believe that they can think of every contingency. A small gap in the Coroners Acts is disclosed in the legal journals. The amending Act of 1926 had a provision (Section 20) to avoid the simultaneous progress of investigations into cases of

murder, manslaughter or infanticide, both before a coroner, on the one hand, and before examining justices and assize courts on the other. The coroner "in the absence of reason to the contrary," is to adjourn his inquest "until after the conclusion of the criminal proceedings." The clerk of the appropriate court is to inform the coroner of the result of those proceedings and, if the coroner then decides not to resume the inquest, the coroner furnishes the registrar of deaths with a certificate stating the result of the proceedings and including any necessary particulars. An inquest was begun last year upon the death of a child. The magistrates committed the child's mother to the November Assizes on a charge of wilful murder. The coroner apparently adjourned his inquest as directed by the 1926 Act. The next step, however, contemplated by the statute cannot be taken. The Home Secretary has ordered the woman's removal to an asylum: she will now not be tried, and consequently the "proceedings" cannot be "concluded" with any "result" of which the coroner can be officially informed. Thus, it would seem, the inquest must take its course. The coroner has found himself obliged to issue a warrant against the mother, bind over the police superintendent to prosecute, and bind over the witnesses to appear and give evidence. It would have been feasible to take the poor woman to the assizes for the formal purpose of obtaining a verdict of "Guilty, but insane." Quite apart from the expense of this course, however, public opinion would deprecate it.

An Unregistered Dental Association.

A case was recently heard before the Oldham borough justices in which a manager of the Co-operative Wholesale Society (Health Insurance Section) was summoned for "practising or holding himself out to practise dentistry," his name not appearing in the Dentists Register. It was argued on behalf of the British Dental Association that it was not essential for the commission of an offence of this kind, that the person should be the actual one who performed the operations of dentistry. A body corporate or limited company could carry on dentistry if the majority of its directors and all its operating staff were dentists, though not otherwise. It was stated that the C.W.S., being an approved society under the Health Insurance Acts, had not agreed to an increase in the scale of dentists' fees in 1926, and despite the fact that it was not a registered organisation under the Dentists Act, had endeavoured to set up dental clinics in certain northern towns. An unregistered dental surgeon had been given charge of such a clinic at Oldham where there was a clerk and four dental mechanics, and patients had been treated there on behalf of the Co-operative Dental Benevolent Association, which was unregistered under the Act. In defence counsel argued that responsibility for what had been done lay with the Association and not with its salaried manager. The chairman and the bench were of opinion, however, that the latter had unlawfully held himself out as practising dentistry and fined him £50, also awarding £25 costs to the prosecution. They agreed to state a case for appeal to the High Court.

Two Deaths Under Anæsthesia.

Arrangements at the Weir Hospital, Balham, were criticised at an inquest on Jan. 2nd on a boy of 4 who died in the institution whilst a fracture of the leg was being reduced under an anæsthetic. There are two resident doctors at the hospital but one of them was away when the child was brought for treatment. The resident medical officer first administered open ether and then instructed a nurse to hold the mask while he reduced the deformity. Death followed from heart failure, despite employment of artificial respiration and stimulants, and at autopsy it was found that the boy had a full stomach which adhered abnormally to the liver. The coroner, in recording a verdict of death by misadventure, said that the resident medical officer had exercised careful judgment in the circumstances, was justified in administering the anæsthetic, and did so properly. At the same time he considered it distinctly inadvisable that the hospital should be left with only one doctor, since only in grave emergency should a medical man play the dual part of anæsthetist and surgeon. It was stated in evidence that the hospital had two visiting surgeons, but it was not customary to call them in except for big operations.

On Jan. 8th the Westminster coroner recorded a similar verdict in the case of a boy of 2 who died during an operation at Charing Cross Hospital. Post mortem large pieces of undigested food were found in the stomach and the pathologist, in ascribing death to syncope, said that the presence of food was probably in part responsible for the accident. The mother said she had not received any instructions about meals, and the doctor who gave the anæsthetic said that she (the doctor) had not seen the child on any previous occasion. The anæsthetic was ethyl chloride, followed later by a mixture of chloroform and ether. The coroner remarked that he thought it was the common practice in hospitals to warn parents not to give their children meals a few hours before anæsthetics would be administered.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Study Leave.

THE refusal of the Minister of Local Government and Public Health to sanction the proposal of the Grangegorman Mental Hospital Committee to give one of their medical officers six months' study leave with pay has given rise to criticism. As was pointed out by a member of the committee, the institution would benefit by the course of study which Dr. J. Dunne proposed to pursue. Another member mentioned that the Minister of Defence had thought it wise to send young officers to study the methods of foreign armies.

The lack of any provision for study leave is a grave fault in the public medical services of the Irish Free State. The Committee of Inquiry on National Health Insurance and the Medical Services in its Interim Report in 1925 made a strong recommendation in favour of the grant of study leave at regular intervals to dispensary medical officers. It was recommended that a period of not less than three months should be given at least as often as once in every five years, and that evidence of having taken advantage of such opportunities should receive consideration where promotion was in question. During such leave the medical officer should receive full salary without deduction for payment of a substitute, and a grant should be made to cover fees for study. It is possible that such a procedure might require legislative authority, but there appears to be no good reason why the Government should not before now have taken action on the Report of the Committee of Inquiry.

The 83 (Dublin) General Hospital.

The annual dinner of the Dublin Unit which staffed the 83 General Hospital, B.E.F., in 1917–18, was held last Saturday night in the Council Room of the Royal College of Surgeons, Colonel Sir William Taylor presiding. Some 15 members of the unit were present.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The New Health Department.

THE Scottish Department of Health came into existence on Jan. 1st. The Scottish Board of Health passed out of existence on Dec. 31st. In point of form the Board was a survival from an older and more amateurish conception of Government service. It was essentially an advisory board with no powers

apart from the President, and, in many respects, quite unsuited to the work of executive administration. The new department is organised on the same general lines as the Ministry of Health. Personal responsibility, under the political direction of the Secretary of State, becomes once more a possibility and a reality. But, in 1919, when the Board of Health was formed, it would have been, for historical reasons, difficult to establish the present type of department. Fortunately, its establishment coincides with the projected revolution in local government. The new department ought, therefore, to be decidedly fruitful for Scottish government, both central and local.

Housing.

At a Conference of the Scottish Labour Housing Association in Glasgow, the Rev. James Barr, M.P., who was for two years a member of the Royal Commission on Housing, gave some striking figures from that report and from subsequent returns. The Commission, in 1917, estimated that Scotland had a shortage of 121,000 houses, without allowing for natural expansion of population and without exacting a higher standard than three persons per room (as against England's two). In 1919 the local authorities themselves admitted a need for 113,000 houses. The Board of Health's estimate in subsequent years was that for every ten years from 1919 there should be added 10,000 houses yearly, thus increasing the shortage to 213,000 houses. Scotland is thus, on official figures, still about 100,000 short. Meanwhile, the local authorities and the central department have been very active, and it is estimated that, including both subsidised and unsubsidised houses, about 100,000 new houses have now been provided. Of these, about 90,000 are subsidised houses built by local authorities or by private persons. In 1928, I am informed, the total built was about 18,000. In 1927 it exceeded 20,000. There is, however, no real falling off, the lesser number in 1928 being due to the fact that there are no new steel houses. There are signs of renewed pressure for an increase of two-room houses. This indicates a failure to grasp the true position. Scotland has already many times more two-roomed houses in proportion to the number of larger houses. And two rooms, it is to be remembered, mean literally just two rooms, not, as it might in England mean, a kitchen and two bedrooms. The industrial world is slow to grasp the simple arithmetical fact that you cannot house a family of seven in two rooms without producing an overcrowding that exceeds three persons per room. As to the one-room house, public opinion is agreed that it should go; but the fact remains that several hundreds of thousands of people in Scotland occupy houses of one room, sometimes very grossly overcrowded. There is still, therefore, a long programme to work off and the next 20 years will not see the end of it.

A Radium Institute for Scotland.

It is satisfactory to learn that the managers of Edinburgh Royal Infirmary have approved of a scheme to establish a radium institute which will be the first in Scotland. For this purpose they have decided to reconstruct a property at Murrayfield, and to contribute, if necessary, a sum of £40,000 from the unrestricted finances of the infirmary. A gift of £10,000 has already been made for the purchase of radium for a Glasgow hospital, and Edinburgh, with its great traditions as a centre of medical science and skill, should not be behindhand in this development. It is intended that the radium institute should be capable of accommodating 30 in-patients, and of serving the needs especially of Edinburgh and the south-east of Scotland. It is eminently desirable that the supply of radium should be concentrated in one or two centres, instead of being distributed among various local hospitals. Local needs can much better be satisfied by providing for the attendance of patients at the central institute, where they will obtain the advantages of the most complete technical equipment and the most expert skill in utilising it. A radium institute has been established in London, and similar facilities are available in some provincial centres in England. But Scotland has hitherto lacked such a centre, the establishment of which will undoubtedly meet a felt need. Government assistance may be expected in obtaining an adequate supply of radium, and public support should not be lacking towards the proper equipment and development of the institute.

Training of Nurses.

In moving the adoption of the annual report of the Scottish Branch of the Queen's Institute of District Nursing, Dr. J. Parlane Kinloch, chief medical officer of the Scottish Department of Health, said the time was opportune to survey the whole position of the nursing service in its relation to public health work. Training schools for nurses had been recognised by the General Nursing Council under the Nurses Registration Act of 1919. It was a serious reflection on hospital authorities generally that the endeavour to link up the general hospitals with the fever hospitals, the sick children hospitals, the maternity hospitals, the mental hospitals, and the special hospitals, with a view to providing a common training school for nurses, wherein the probationer nurse could receive within a period of four years a comprehensive training in nursing methods, had been unsuccessful. It was only necessary to look to the medical training schools to recognise what this failure to organise the nurses' training schools really meant. The great training centres in Scotland were doing increasingly admirable work, but he thought there had been a tendency to overdo the drilling in our great hospitals. If machine-like drilling was carried into the ward it swamped personality. The biggest thing that could happen to the nursing profession was for the authorities of our voluntary and statutory hospitals and for the Council of the Queen's Nurses to use their prestige and influence to bring those bodies about and get regional training schools for nurses built around the walls of the four universities of Scotland.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

"Christian Healing."

SOME interest has been aroused in medical circles by the report given recently by a Commission of Bishops and Deputies to the General Convention of the Protestant Episcopal Church. This Commission has been considering evidence of "Christian healing" since its appointment three years ago and has heard physicians and neurologists as well as parish priests and the hearsay testimony of persons of unquestioned veracity. On the one hand the Commission recommended that all faith-healing should be carried on in close coöperation with medical science, but on the other they state that throughout the world spiritual healing is no longer the hope of a few but the belief and practice of a large and rapidly increasing number of persons. On these conclusions the *Ohio State Medical Journal* has the following editorial comment:

A proper spiritual attitude cannot help but be beneficial to a physician who serves his patients with a reverence for the forces of God. In like manner, a spiritual and reverential attitude on the part of the patient is desired, but to assume that faith or religion even in a small measure can be a substitute for definite medical sciences is fallacious. Too many instances have been recorded where religious zealots neglected and ignored physical conditions such as cancer, tuberculosis, diabetes, and Bright's disease until even their own "faith" could not prevent them from suffering a painful and early death.

Income-tax Deductions.

Six years ago the Commissioner of Revenue denied to physicians the right to deduct from their taxable incomes the expenses incurred in attending professional meetings. Since then the American Medical

Association has carried on a consistent campaign for the reversal of this decision. Legislation favourable to the Association's claims was passed through the Senate during the last session of Congress but lost in a compromise with the lower house. Now a legal victory has been won through an appeal to the Board of Tax Appeals. The physician who fought the test case had expended during the years 1920, 1921, 1922, and 1923 the respective sums $16, $230, $375, and $384.46 for "railroad fare, accommodations, and meals" in connexion with meetings of medical associations. He had not been allowed to deduct these sums in whole or in part from his taxable income. The Board of Appeals has overruled the Commissioner's decision, and unless an appeal is made by the latter to higher courts before April, 1929, the ruling will become final and within certain time-limits will be retrospective. It is estimated that the medical profession has paid as much as half a million dollars under the former ruling and that a large part of this sum will be recoverable.

Negative Results with Tubercle Vaccines.

The results of experiments with two different vaccines were reported on Dec. 6th to the National Livestock Sanitary Association by Stillman J. Stanard, director of agriculture of Illinois. From the scanty press accounts as yet available it appears that one vaccine was the celebrated B.C.G. and the other a ricinoleated vaccine prepared by Dr. Larson, of the University of Minnesota. Ten infected cattle were added two years ago to a herd of 60 tuberculin-tested cattle. The latter consisted of 20 controls and 20 animals immunised by each of the two vaccines. It appears that after two years autopsies of this herd show that only a few of the animals "immunised" with the Larson vaccine had escaped infection; all the controls and all animals "immunised" with B.C.G. were infected.

Rejuvenating Epithelium.

For some years past Dr. Joseph Franz Kapp, of New York, has been working on a method for rejuvenating the epidermis at the time of life when it begins to share in the changes of senescence. By immunising rabbits with a maceration of the skin of young pigs he obtained a serum which, when administered subcutaneously, led to an increase in mitosis and a restoration of capillaries in the derma. A preliminary report, recently presented by Dr. Kurt Holzapfel, of Berlin, and himself, deals with the effect of this novepithel, as it is called, on 71 cases of various skin affections. It proved wholly or partially successful in cases of bedsore, eczema, ulcus cruris, alopecia, zoster, and scleroderma, while the effect was small or absent in psoriasis and rosacea. The results, they suggest, are sufficiently favourable to warrant further investigation on a large scale. At present the serum is being tested at the Berlin Charité by Prof. Friedr. Kraus, in Vienna by Prof. Alf. Perutz, while Prof. Erich Hoffmann is trying experiments on a large scale at the Dermatological Clinic of Bonn. The preparation is not yet on the market in America, but it has been placed at the disposal of dermatologists, such as Dr. J. Eller at the New York Post-Graduate Hospital, Dr. Conrad Miller, of Chicago, and Prof. Otto Lerch, of Tulane. Kapp himself was stimulated to further trial of the preparation by finding it promise well for the tormenting pruritus of elderly persons.

Valentine Mott.

At a recent meeting of the New York Academy of Medicine Dr. Louis F. Bishop, of New York, read a paper on Valentine Mott, a surgeon who in his day enjoyed an international fame for deftness of hand and boldness of execution little less than that of his London teacher, Sir Astley Cooper. It is remarkable that at the time of his graduation in 1806 Mott gave no indication of his interest in surgery, and concerned himself chiefly with chemistry; but the teaching and example of Cooper developed in the New York physician a zest for surgery which grew more and more keen the longer he remained in London. After leaving Cooper's influence, Mott, as was then the custom with young American medical graduates, proceeded to Edinburgh, where he sat at the feet of Gregory, Home, Duncan, Hope, and Playfair. Two years after his return to New York he was elected to the chair of surgery at Columbia College. In his sketch of Mott's professional life Dr. Bishop claimed that he was the first to deliver private lectures in America on any medical subject, and the first to demonstrate to a class the steps of surgical operative surgery as then practised.

THE CONGRESS OF MEDICINE IN EGYPT.

OVER 2000 medical delegates and members of the medical profession, drawn from Europe, North and South America, the Near and Far East, gathered in Cairo on Dec. 15th last for the twofold purpose of celebrating the Centenary of the Cairo Faculty of Medicine and joining in a Conference on Tropical Medicine and Hygiene.

Since Clot Bey was first summoned from France by Mohammed Ali in 1825 to inaugurate a medical service in Egypt, enormous strides have been made, and if during the first half of this period progress was slow, and even at times interrupted, during the last 50 years a hospital service, a centre of medical education, and a public health administration have emerged which reflect immense credit upon the Governments by which they have been fostered, and afford an enduring memorial of the many notable men—such as Bilharz, Sandwith, Milton, Keatinge, and Loos (to mention only a few) who have chiefly shaped the course of events. It was right that advantage should be taken of the Centenary celebration to invite the attendance of representatives from all over the world to see for themselves how surely the foundations of Egyptian medicine have been laid, how bright are the prospects for its future, and with what zeal the problems of preventive and curative medicine peculiar to the land of Egypt are being tackled. The British delegation was numerically small but representative, including, amongst others, Sir George Newman, Sir Robert Philip, Sir Berkeley Moynihan, Sir Holburt Waring, Sir StClair Thomson, Sir William de Courcy Wheeler, Sir Frank Collyer, Dr. Monro Kerr, Prof. Nuttall, and Dr. J. B. Christopherson.

The Proceedings of the Congress.

The proceedings opened on the morning of Dec. 15th with a function in the Opera House attended by H.M. King Fuad. After an introductory address by the President of the Congress, His Excellency the Minister of Education, addresses were presented by representatives of the Governments of France, England, United States of America, Germany, Italy, Greece, and Japan, Sir George Newman being the English spokesman. The same afternoon King Fuad opened in state a Medical and Sanitary Exhibition in the grounds of the Royal Agricultural Society, in which the Egyptian Department of Public Health had staged an attractive display of models illustrating every phase of the work now proceeding.

The following morning, Sunday, the 16th, in a marquee of colossal proportions and oriental design, H.M. the King laid the foundation-stone of the new Hospital and Medical School which is on the point of being built to take the place of the historical Kasr-el-Aini Hospital. This new hospital is designed to provide 700 beds, and the site available—an ideal one upon Roda Island—allows ample room for medical school, students' hostel, and sports grounds immediately adjacent to the hospital. The plans available for inspection suggest that with the abundant funds at their command the architects have designed a group of buildings that will be the envy of many a larger city than Cairo. Later the same day a large

audience was presided over by Sir Berkeley Moynihan, who, as President of the Royal College of Surgeons of England, conferred the diploma of Fellow upon Ali Bey Ibrahim, Professor of Clinical Surgery and Sub-Dean of the Faculty of Medicine. The enthusiasm aroused in the audience by this compliment paid to an outstanding surgeon and a popular personality lasted on for the next two hours, during which a never-ending procession of delegates made their bow to the President of the Congress and handed him their addresses.

The Work of the Congress.

The work of the Congress proper, which started on Monday, Dec. 17th, was divided up into 16 sections devoted to such subjects, among others, as medicine, surgery, bilharziasis, dysentery, tuberculosis, leishmaniasis, and malaria, and sessions were held of some or all of these on the mornings of five days. Résumés of the chief contributions, which were delivered in either English, French, or German, were printed and circulated for the benefit of delegates, who were thus enabled to select the place of their attendance to their individual taste. The chief interest perhaps centred round the subjects of special local importance, such as tuberculosis, trachoma, bilharziasis, and pellagra, and it is only necessary to mention that Drs. Van der Hoeve, Giemsa, Schuffner, Castellani, Christopherson, Ashford, and Wilson took part, to ensure that the Proceedings of the Conference, when they appear, will be studied with especial interest. Whilst the attendance at the sectional meetings was good, it must be confessed that a punctilious devotion of five mornings to the Congress seemed too much like work to many of those who had come long distances to visit Egypt for the first time, and many a Congress badge—a charming gilt emblem of Im-Hotep—was to be seen in the Cairo museums, the mosques, and elsewhere during Congress hours.

At the official closing of the Conference in the afternoon of Dec. 22nd, 13 honorary degrees of the University of Cairo were conferred upon delegates.

Social Events.

A full programme of social events filled up the afternoons and evenings. The King received the whole company in the Abdin Palace on the opening night. The following evening the capacity of Shepheard's Hotel was fully taxed on the occasion of the official dinner presided over, in the absence of the Prime Minister through ill-health, by His Excellency Shahin Pasha, and on yet another evening Their Excellencies Lord and Lady Lloyd had invited British delegates and others to an evening reception at the Residency. Tea parties at the Medical School, at the Pyramids, and at the Delta Barrage were most popular afternoon functions.

The warmest praise is due to the Organisation Committee, owing to whose efforts everything passed off without difficulty or hitch, in spite of the large numbers, while a special word of thanks is due to the Ladies' Committee, whose organisation enabled those accompanying the delegates to visit the sights of Cairo and the neighbourhood under expert guidance. Special concessions granted by the railway companies and the hotels assisted materially those who wisely wished to combine with their attendance at the Conference visits to the treasures of Upper and Lower Egypt. The opportunity so afforded of seeing the antiquities and gaining an insight into the Medical School of Cairo and the problems of public health which face the Egyptian Government made the visit of those fortunate enough to be able to attend a very memorable one.

METROPOLITAN ASYLUMS BOARD.—The Board has approved a scheme, costing about £30,000, for the provision of a new nurses' home at the Downs Hospital for Children.

RESEARCH ON TUBERCULOSIS.—Mr. Halley Stewart has given £700 a year for five years towards special research at the Brompton Hospital for Consumption and Diseases of the Chest.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH FOR 1928.

THE customary circular, lately issued by the Ministry of Health, shows that the 1928 reports are to be ordinary, and not "survey," reports. Attention to new features is drawn by marginal lines.

The circular announces that the Registrar-General will distribute his short list of the causes of death in the various districts in February or March, 1929, with the exception of the county aggregates, which will be distributed in April. The hope is expressed that this early distribution of the figures will enable each report to be completed not later than the middle of May. Reference is made to the fact that in certain districts local estimates of population and classification of deaths are preferred, but it is particularly requested that when this is the case the Registrar's figures shall also be included in the report in order to facilitate comparison with the figures for other areas. The Registrar-General receives frequent applications from medical officers of health for information as to the death-rates in the whole country from cancer, from pulmonary and other forms of tuberculosis, and from childbirth, and to obviate the necessity for such applications, the death-rates mentioned will be published in the Registrar-General's Weekly Return as soon as the necessary data are available.

The following are some of the matters emphasised in the circular. Particulars are to be given of the amount, situation, and nature of accommodation, and by whom provided, of clinics and treatment centres of all kinds, including orthopædic and light clinics. Full information is demanded as to applications for the registration of maternity and nursing homes and the result of such applications. Up to July 1st this will only apply to maternity homes, but after that date to both maternity and nursing homes. County councils are also required to give particulars of applications for the delegation of their powers under the Nursing and Maternity Homes Registration Acts. Any special arrangements made for the investigation of maternal deaths and cases of puerperal fever are to be described.

The results of the analyses of public water-supplies, whether piped or not, are specially asked for. Other matters stressed include the adequacy of the arrangements for the disposal of the dead; arrangements made for the publication or dissemination of knowledge relating to health or disease; particulars of inspections made or actions taken under the Rag-Flock Acts, 1911 and 1928; action taken under the Food and Drugs Acts, including the Public Health (Preservatives, &c., in Food) Regulations, 1925–1927); particulars about work done at laboratories for the chemical and bacteriological examination of food; the prevalence of animal or insect pests, such as rats or mosquitoes, and the measures taken for their suppression; and particulars of action taken under Section 66 of the Public Health Amendment Act, 1925, for the prevention of blindness or the treatment of persons suffering from any disease or injury to the eyes.

The study of these annual reports followed by the perusal of the circular leaves one in the hope that the day is not far distant when the decision of the Registrar-General as to estimates of population and classification of deaths will be accepted as that of an umpire, and that before long, perhaps with the good offices of Geneva, we shall have one system of classifying deaths associated with childbirth in every country in the world.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 29TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 131 (last week 201); scarlet fever, 2275 (last week

2451); diphtheria, 1225; enteric fever, 40; pneumonia, 1616; puerperal fever, 43; puerperal pyrexia, 86; cerebro-spinal fever, 6; acute poliomyelitis, 2; acute polio-encephalitis, 1; encephalitis lethargica, 14; dysentery, 4; and ophthalmia neonatorum, 94. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified in the following 17 counties: London, 10 (Poplar); Chester, 2; Derby, 12; Durham, 26 (Jarrow 13); Essex, 2 (West Ham); Huntingdon, 1; Lancaster, 10; Leicester, 6 (county borough); Northampton, 6 (county borough); Northumberland, 10 (Tynemouth C.B.); Nottingham, 9; Soke of Peterborough, 2; Stafford, 3; Yorks, West Riding, 12 (Halifax 7); Brecknock, 1; Glamorgan, 13; Monmouth, 6.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Jan. 1st–2nd was as follows: Small-pox, 28 (4 under treatment); scarlet fever, 2248; diphtheria, 2201; enteric fever, 19; measles, 37; whooping-cough, 530; puerperal fever, 23 (plus 5 babies); encephalitis lethargica, 74; poliomyelitis, 5; other diseases, 28. At St. Margaret's Hospital there were 13 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 24 (0) from measles, 13 (1) from scarlet fever, 56 (18) from whooping-cough, 52 (8) from diphtheria, 49 (5) from diarrhœa and enteritis under two years, and 83 (15) from influenza. (The figures in parentheses are those for London itself.) The number of deaths from influenza during the previous seven weeks were 68, 72, 49, 56, 60, 61, and 69 respectively.

The fatal cases of enteric fever were reported from Grimsby and Sheffield. Liverpool reported 7 deaths from measles, Cardiff 3, whilst Lincoln, Middlesbrough, and Newcastle-on-Tyne had 2 each (Belfast 7). There were 8 deaths from whooping-cough in Manchester, 6 in Leeds, and 4 in Salford. Five deaths from diphtheria occurred in Liverpool, whilst Liverpool also reported 4 deaths from diarrhœa. Outside London the largest number of deaths from influenza was Birmingham, 6; Manchester reported 5, Liverpool 4, and Stockport, Leeds, Hull, and South Shields 3 each. (The figure for Glasgow was 7.)

The number of stillbirths registered during the week in the great towns was 264 (corresponding to a rate of 55 per 1000 total births), including 41 in London.

The Services.

ROYAL ARMY MEDICAL CORPS COMMISSIONS.

A LIMITED number of commissions in the Royal Army Medical Corps without entrance examination are being offered to qualified practitioners under 28 years of age. Applications should reach the War Office not later than Jan. 25th, and information as to conditions of service and emoluments may be obtained from the Under Secretary of State, War Office (A.M.D.1), Whitehall, London, S.W. 1.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. N. S. Meiklejohn to be Surg. Capt.

Surg. Lt.-Comdrs. (D.).—A. T. Dally to *Pembroke*, for R.M. Infirmary, Deal; J. T. Wood *to Vivid*, for R.N. Hospl., Plymouth; M. F. Hopson to *Pembroke*, for R.N. Barracks; and W. E. A. Sampson to *Vivid*, for R.N. Barracks, Devonport.

Surg. Lts. E. W. Graham to *Victory*, for R.N. Barracks, Portsmouth; R. G. E. Richmond to *Pembroke*, for R.N. Barracks, Chatham; and H. S. Marks to *Vivid*, for R.N. Barracks, Devonport.

ROYAL ARMY MEDICAL CORPS.

Capt. G. H. Barry to be Maj. (Prov.), and remains secd.

D. Blewitt to be Lt. on prob.

ARMY DENTAL CORPS.

Capt. G. A. Ballantyne resigns his commn.

ROYAL AIR FORCE.

Squadron Leader A. Grant to be Wing Comdr.

INDIAN MEDICAL SERVICE.

Lt. W. Scott to be Capt. (prov.).

Correspondence.

"Audi alteram partem."

THE TREATMENT OF HÆMORRHOIDS BY INJECTION.

To the Editor of THE LANCET.

SIR,—I was greatly interested in Mr. Christopher Howard's article in THE LANCET of Jan. 5th on Submucous Injection of Hæmorrhoids with Quinine Urea Hydrochloride. As he writes, the method he describes differs from my own mainly in the choice of the solution used and in minor details of technique. I myself tried using quinine urea hydrochloride some years ago. I did so with some trepidation, because a good many cases of serious sloughing of the skin had been reported after the use of this drug hypodermically as a local anæsthetic, although it had been used for that purpose in a strength as low as 1 per cent. I found that a 1 per cent. solution of quinine urea hydrochloride was quite ineffective for the treatment of internal hæmorrhoids and eventually I tried a 2 per cent. solution. Even this strength was found to be very variable in its action, and the symptoms, such as hæmorrhage and prolapse, did not yield immediately after the first injection in the way they almost invariably did to the strong carbolic glycerine solution which I was in the habit of using at that time. Nevertheless I encountered several cases of unpleasant sloughing even amongst the few cases which I treated with quinine urea hydrochloride, and where sloughs occurred there was a considerable amount of pain after the anæsthetic action of the solution had passed off. At that time I did not practise submucous injection, but deliberately injected the solution into the centre of the pile-mass. A priori, one would expect sloughing to take place more readily when the solution is injected submucously and when a considerable degree of distension of the submucous tissue is aimed at, and still more so when a solution as strong as 5 per cent. is employed. It was therefore with some surprise that I read in Mr. Howard's article of the success of this method in his hands and in those of Dr. Bensaude, of Paris. It is to be hoped that later on Mr. Howard will publish his further experiences with the treatment, dealing more particularly with the question of the permanence of the "cure." For my own part I have obtained such uniformly satisfactory results with the 5 per cent. carbolic in almond oil which I have been using for over two years (see THE LANCET, 1928, i., 543), that I do not feel tempted to make any experiments with other methods. Quinine urea hydrochloride has been used largely for the injection of hæmorrhoids in the United States of America, notably by Dr. Terrell and Dr. T. Chittenden Hill—but I gather that it has been superseded by the majority of "ambulant proctologists" there in favour of the carbolic-oil submucous injection.

One objection that I see to the use of a solution of quinine urea hydrochloride is that it is at best only very feebly antiseptic, and, if by some mischance the solution became contaminated, very serious results might follow. The carbolic-oil solution has the great advantage of being a powerful antiseptic and of being almost "fool-proof" from that point of view. Nevertheless I agree heartily with Mr. Howard that every detail of the procedure should be carried out with full aseptic and antiseptic precautions, *more especially because* the site of the operation is necessarily a septic one. From this point of view the tendency of quinine urea hydrochloride to produce an urgent desire to defæcate some ten minutes after the injection seems to me a rather grave disadvantage.

"There are more ways of killing a dog than by hanging it," and I have no doubt that there are other solutions equally as good as the 5 per cent. carbolic-oil solution; but the results I have obtained with this solution have been so uniformly satisfactory that I doubt whether there is anything better. The frequent appearance of articles in the medical press on various

methods of treating hæmorrhoids by injection and by other "ambulatory" methods shows that at last the profession has realised that operations on hæmorrhoids are disliked by patients and that the latter, too, are becoming aware that operation is not the only or the most satisfactory way of dealing with this common and troublesome ailment.

I am, Sir, yours faithfully,

ARTHUR S. MORLEY.

Upper Wimpole-street, W., Jan. 5th, 1929.

LONDON COUNTY COUNCIL (GENERAL POWERS) ACT, 1920.

To the Editor of THE LANCET.

SIR,—This Act, passed some years ago, has recently been put into action. One clause of the Act required that any medical practitioner, carrying on work of the nature covered by the Act, might send in an "exemption certificate" annually and so avoid taking out the licence which is necessary for all other persons. The underlying idea of the Act in question was undoubtedly good, in that it was a real attempt to protect the public from unqualified persons, who were getting bolder in irregular practice, and had even gone the length of installing X ray apparatus for the depilation of facial hair, "when nature in vagary mistakes for Thomas, Mistress Mary,"—a most dangerous and gross form of treatment. Quite apart from the efficacy of such a procedure, many of the people treated may, sooner or later, in place of a few hairs have telangiectases, if nothing more serious. It was felt therefore, much as the idea of yet another body being allowed to regulate the practice of a duly registered medical practitioner was resented, that the Act had been passed and it was our duty to obey it. The London County Council have been most helpful and sympathetic so far as the medical members of the British Institute of Radiology are concerned, and they have agreed (in lieu of the personal certificate signed by two medical practitioners) to accept a single certificate signed by officials of the Institute, together with a schedule of names, as complying with the requirements of the Act. In acknowledging the schedule the official of the L.C.C. made the following observations:—

"With regard to the question of inspection, I would point out that, provided the required certificate has been furnished in respect of an establishment carried on by a registered medical practitioner, the Council's officers have no power to inspect such establishment."

As one of the most objectionable features of the Act was the domiciliary visit of inspection to the consulting-room of a registered medical practitioner, I think you will do a great service by making the above comment widely known. There is much in the Act that appears capable of more than one interpretation, and it seems likely that this may have to be solved by a friendly action in the law courts, but such a question is hardly of immediate concern.

I am, Sir, yours faithfully,

London, W., Jan. 3rd, 1929. STANLEY MELVILLE.

TONSILLECTOMY OR GALVANO-PUNCTURE?

To the Editor of THE LANCET.

SIR,—I have read with interest Dr. Berkeley Way's lucid account of his attack of general staphylococcal infection (THE LANCET, Dec. 29th, 1928, p. 1367). Cases of the kind are not uncommon, but an invasion of the tonsil by *Staphylococcus p.* is surely very rare. I have never seen such a condition, and I cannot believe that in Dr. Way's case the primary nidus of the infection was in the tonsil. There was diffuse furunculosis, and what Dr. Way rather vaguely calls carbuncles, which I presume were very large furuncles. There were abscesses in the axilla, obviously not of tonsillar origin, and there were quinsies, which I presume were peritonsillar abscesses, and therefore behind the capsule. To entirely liberate the collections of pus from these pocks behind the tonsil a resection of the tonsil was necessary. Adhesions of the capsule to the peritonsillar tissue behind were, in the circumstances, inevitable, but could not be attributed to the effect of the cautery unless the burner had perforated the capsule, which one is careful to avoid doing when using the galvano-cautery.

These cases of diffuse staphylococcal infection last for months and are very troublesome. I have seen one which ran on for two years, but eventually yielded to an autogenous vaccine. One would think, however, that in Dr. Way's case a considerable auto-immunisation had taken effect by the time the tonsils were removed. I am unable to follow his reasoning when he suggests an analogy between a septic tooth and a septic tonsil. A tooth is a purely mechanical structure, designed for biting and mastication; the tonsil is a lymph gland with a highly specialised function; at present we know only of its protective action, but it may eventually be proved to be one of the endocrine organs. In the many hundreds of cases which I have treated with the galvano-cautery I have never seen any closure of crypts, nor any recurrence of sepsis; and the red vascular appearance of the mucous membrane quickly subsides under the continued use of the chloramine spray.—I am, Sir, yours faithfully,

W. S. WHITCOMBE, M.D.

Harley-street, W., Dec. 30th, 1928.

A TUDOR ACT OF INDEMNITY FOR UNQUALIFIED PRACTICE.

To the Editor of THE LANCET.

SIR,—I notice among the correspondence recently appearing in your paper relative to the above Act that its authenticity is questioned. Further, that information is desired as to whether the document at New Romney is a copy of the Statute or a proclamation. The document in question is undoubtedly authentic, having been found among a bundle of proclamations, dating from Henry VII.'s reign to the eighteenth century. In itself it is one of the many regular printed proclamations of the time, presumably sent down to the town from London, in the ordinary custom of those times.

That these valuable proclamations have been preserved is due to the care which successive town clerks of New Romney have given to the documents in their charge.

I am, Sir, yours faithfully,

M. TEICHMAN-DERVILLE (Major).

Littlestone, New Romney, Kent, Jan. 3rd, 1929.

PROGNOSIS IN UNOPERATED CASES OF EXOPHTHALMIC GOITRE,

INCLUDING TOXIC ADENOMA.

To the Editor of THE LANCET.

SIR,—May I ask for information from those surgeons and physicians who have treated many cases of Graves's disease on the question of prognosis in cases where the patient declines operation? To avoid confusion these cases may be divided into the following two classes: (*a*) primary Graves' (diffusely enlarged vascular thyroid with hyperplasia); and (*b*) secondary Graves' (including toxic adenoma and cases following simple goitre). The patient (usually female) is not interested in percentages of deaths and recoveries. What she wants to know is the prognosis, without operation, in her individual case.

The points, on which I should be grateful for information, distinguishing between (*a*) primary and (*b*) secondary Graves's disease are: (1) Is it possible to give a correct prognosis as to what will happen in the individual case which is not operated upon? 2. If this is possible, what are the signs and symptoms on which the prognosis should be based?

I am, Sir, yours faithfully,

C. HAMILTON WHITEFORD.

Plymouth, Dec. 28th, 1928.

OSLER AS EPIDEMIOLOGIST.

To the Editor of THE LANCET.

SIR,—The statement on page 1222 in THE LANCET of Dec. 8th, 1928, made at a meeting of the Osler Club last July, "when Osler was professor of medicine at Harvard," should, of course, be "when Osler was professor of medicine at Johns Hopkins University." That the statement is merely a slip on the part of the speaker is shown by the immediate reference to Baltimore. That Osler could have gone in 1909 to Boston as medical adviser of the then new hospital on the Peter Bent Brigham Foundation is a well-known fact among his friends.[1]

The following incident has never appeared in print, and may be put on record in this connexion: In January, 1894, I was editing the *International Medical Magazine*, started as a companion monthly to the quarterly *International Clinics*, of which the 152nd volume has just been gotten out under my editorship, and I decided to report for its pages [2] a special meeting of the College of Physicians of Philadelphia called for Jan. 12th, 1894, with the object of discussing the subject of the proposed action of the Board of Health of Philadelphia in reference to the registration of patients suffering from tuberculosis. In the innocence of my then young medical life I invited the professor of bacteriology in the Woman's Medical College of Philadelphia and a few medical students of my class in pathology at the University of Pennsylvania to attend the meeting, and such was the fame of the former clinical professor of medicine in that institution of learning, then at Johns Hopkins University in Baltimore, that instead of a few students—the invitation had been passed on from mouth to mouth—they seemed like the sands of the sea in number when I entered the room and found the one lone female, my assistant at St. Clement's Dispensary, and the students occupying all available seats, thus making many of the Fellows to stand. Dr. Weir Mitchell was in the chair, and on opening the meeting called the secretary to him and requested that he read from the by-laws the section covering the admission of strangers to the meetings of the College, which required that this be done by a viva voce introduction at the time of the meeting. The professor was properly introduced by name, and "some medical students" covered the remainder, some of whom by this time having seen the propriety of surrendering their seats to Fellows. I can still recall the consolation which I got out of Osler's evident enjoyment of the, to me, embarrassing situation.

At this meeting Osler was one of the few physicians present advocating the making of the reporting of all open cases of tuberculosis mandatory, but the resolution of the Council of the College that this should not be done, was passed. At the time Dr. Osler kindly sent me the following outline of his remarks for publication[3]:—

First.—Following a primary law of parasitism, the bacillus tuberculosis frequents chiefly that organ in its host which communicates most freely with the exterior. Just as countless thousands of ova are thrown off from the intestine of the bearer of a tapeworm, so from tuberculous lungs in a state of softening and cavity-formation, countless millions of bacilli are cast out daily with the sputum.

Second.—The widespread diffusion of the parasite outside of the body has been demonstrated in the infectiveness of the dust and of the scrapings of the walls of rooms and wards occupied by patients with pulmonary consumption. Moreover, the greater prevalence of tuberculosis in crowded communities, the enormous mortality from the disease in prisons and institutions, and its frequent occurrence as a house malady, suggest that the conditions favouring its continuance are those which foster the growth and spread of a specific contagion.

Third.—In the language of parasitology the lungs constitute the chief seat of election. But, apart also from gross pulmonary lesions, the proportion of autopsies in which the bronchial glands are found tuberculous speaks unmistakably for direct infection in the existence of their function as dust filters.

On these grounds I believe that the registration of pulmonary tuberculosis would be beneficial—enforcing attention to those sanitary details so apt to be slighted or overlooked, and diminishing directly the danger of contagion in the community.

Infection through food is closely related also to the endemic prevalence of tuberculosis. The incidence of the disease in the mesenteric glands of infants indicates that the gastro-intestinal canal is a portal of infection only a little less wide than that of the respiratory tract.

The question of tuberculosis is not, however, settled with the disinfection of the sputa of consumptives.

The hereditary transmission of the disease must be accepted, though an estimate of the frequency of this mode of infection must necessarily be uncertain, but for certain forms Baumgarten's theory of latency is particularly suggestive. Tuberculosis has been well called the *pébrine* of the human race. The analogy is striking, for not only, as you will remember, is the parasite of the silkworm disease transmitted by direct contagion, but it also infects the eggs, which hatch, and may pass through various stages of development before they are finally destroyed.

Lastly, and here is consolation, the conditions which render individuals more or less immune scarcely yield in importance to those which maintain the vitality of the tubercle bacilli in a community. So widespread is the disease that few of us escape infection,[4] and the statistics of the Paris morgue show that in more than 50 per cent. of adults the germs not only gain an entrance, but actually effect a lodgment. As a factor in tuberculosis, the *soil*, then, has a value equal almost to that which relates to the *seed*, and in taking measures to limit the diffusion of the parasite let us not forget the importance to the possible host of combating inherited weakness, of removing acquired debility, and of maintaining the nutrition at a standard of aggressive activity.

And it is to be remembered that this was written by Osler 35 years ago, within 12 years after the discovery of the tubercle bacillus by Koch.

I am, Sir, yours faithfully,

HENRY W. CATTELL.

Cookstown, N.J., U.S.A., Dec. 23rd, 1928.

[1] Cushing: Life of Sir William Osler, vol. iii., p. 178.
[2] Vol. iii., p. 118.
[3] Loc. cit., pp. 123–4.

THE AIR TRANSPORT OF INVALIDS.

To the Editor of THE LANCET.

SIR,—It may be of general interest to the medical profession to know of the facilities offered by air transport to patients travelling abroad, who by reason of their state of health are unable to stand the strain by the ordinary boat and train routes. In the past we have carried several invalids, including stretcher cases, to various destinations, either on scheduled services or by specially chartered aircraft; in the most recent of these cases we have received a letter from the husband of the patient, who has given us permission to use it in the interest of others, who, no doubt, would like to consider this mode of travel, should they feel that the longer journey by train and boat presents insuperable difficulties. In the particular case under review the patient was suffering from a spinal complaint and was proceeding to a sanatorium at Leysin in Switzerland. The journey was undertaken in the company of her husband and nurse, a bed being provided in the forward portion of the cabin, thus causing no inconvenience to the ordinary passengers on board. The party was carried on an ordinary service aircraft, an additional fare being charged for the patient owing to the extra floor space occupied, the actual flying times being: Depart Croydon, 08.00; arrive Paris, 10.20; depart Paris, 11.10; arrive Basle, 13.58; 485 miles, as against 14 hours, 560 miles by boat and train, quickest route. As there was no aerodrome suitable in the vicinity of Leysin a connexion from Basle was made in a saloon car, in which the patient again travelled in a prone position. Refreshments were supplied en route and at Paris the privacy of the machine was secured for the patient, so that the nurse could attend to her.

From a subsequent conversation we had with the manager of the agency, who dealt with the inquiry in

[4] Osler himself at various times had anatomical warts from the making of antopsies.

the original instance, it is understood that the husband was of the opinion that the comfort and ease of the journey was far superior to that of the alternative routes and that the slight jarring caused when the aeroplane was taking off and landing, although quite perceptible, was never likely to cause any injurious discomfort to the patient.

We are, Sir, yours faithfully,

IMPERIAL AIRWAYS, LIMITED.

Airways House, Charles-street, S.W., Jan. 1st, 1929.

THE ASTHMA RESEARCH COUNCIL.

To the Editor of THE LANCET.

SIR,—In view of statements which have recently appeared in the press to the effect that a "certain cure" for asthma has been found, we, the undersigned, desire to place on record that there is no such "cure" known to medical science and that there is not any one form of treatment which is effective in all cases of asthma.

Investigations are being made under the auspices of the Asthma Research Council and with the approval and support of the Medical Research Council and the Ministry of Health into the mysteries of this distressing complaint which, it is hoped, will lead to a better knowledge of its origin and to the discovery of improved methods of prevention and treatment.

We hope that all interested in the subject, and especially well-to-do sufferers, will give their moral and financial support to the campaign, which will be inaugurated by the Lord Mayor of London at the Mansion House on Jan. 15th, for a national fund to provide research centres at several of the leading London and provincial hospitals, where asthma and its allied diseases will be scientifically and exhaustively investigated. Donations and offers of assistance should be sent to Sir Albert Stern, K.B.E., C.M.G., Hon. Treasurer, Asthma Research Council, London Clinic, Ranelagh-road, London, S.W. 1.

We are, Sir, yours faithfully,

HUMPHRY ROLLESTON,
DAWSON OF PENN,
ARTHUR F. HURST,
F. E. FREMANTLE.

Jan. 11th, 1929.

THE GRANULES OF THE TUBERCLE BACILLUS.

To the Editor of THE LANCET.

SIR,—In your issue of Dec. 29th, 1928, under the above heading, when you favour me by making some criticisms upon my book [1] upon the tubercle virus, you make a mistake which is of importance when you say that the photomicrographs reproduced there were taken with 1/18th immersion lens. These photomicrographs have been taken direct, no enlargements whatever, with the "Davon super microscope" [2] and they are all at a magnification of × 4000 and ×5000, and so far as I am aware they are the first to be published in any book. These have the great advantage that from a morphological point of view they are more reliable than others, and they are therefore worthy of the especial notice of research workers.

I am, Sir, yours faithfully,

WM. C. MINCHIN.

Quarry-road, Hastings, Jan. 4th, 1929.

[1] Study in Tubercle Virus. London: Baillière, Tindall, and Cox.
[2] Messrs. Davidson and Co., Great Portland-street, London.

"HEALTH COLUMNS" IN THE PUBLIC PRESS.

To the Editor of THE LANCET.

SIR,—Where is this promiscuous medical advice in the "health columns" of various journals going to end? In the current number of a certain magazine an amazing amount of advice is given to correspondents which is far beyond the scope of diagnosis and treatment by correspondence. One reader is advised to get treatment, "such as injection of a polyvalent vaccine of staphylococci-streptococci and *Micrococcus catarrhalis*." Another is told to ask her doctor if she might have a course of about twelve injections of arsenic and manganese. A further inquirer is told to ask for injections of glycerophosphates! These are only a few samples of the variety of advice and prescriptions which are proferred. It seems to me that the medical profession should take steps to limit this wanton dealing out of so-called medical help.

I am, Sir, yours faithfully,

HAROLD LONG.

Stormont-road, Highgate, N., Jan. 4th, 1929.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT BILL.

(*Concluded from p. 52 of last issue.*)

Exemption of Maternity Homes.

Miss BONDFIELD then moved an amendment to remove maternity homes from the operation of the clause, and particularly from the operation of the uniform enforcement of the provision which had just been discussed. She said that the work in connexion with maternal mortality was still in an experimental stage, and anything which shook the present position was bound to act to the detriment of the service. For instance, the psychological effect of making a provision so that the operation of the financial arrangements in regard to municipal maternity centres were on precisely the same lines as those of the poor-law would be a deterrent so far as a great many women were concerned.

Sir KINGSLEY WOOD said that while he agreed as to the importance of making due provision for maternity, and encouraging as many mothers as possible to enter maternity homes, if Miss Bondfield thought that under this clause they were swopping horses and altering the present practice she was greatly mistaken. The provision which was being inserted in the clause generally was already the invariable practice so far as maternity homes, both municipal and voluntary, in this country were concerned. The clause, so far from making any alteration, really set out what was the universal practice of the voluntary maternity hospitals and homes to require that inmates or their relatives should pay what they could for the service. Some 60 or 70 municipal maternity homes recovered appropriate contributions unless they were satisfied, having regard to the circumstances of the inmate, that nothing could be paid. Therefore, there was no ground for saying that there was any alteration in the practice, or for anyone being frightened away from the maternity homes of the country by the application of this clause.

Replying to further debate, Mr. CHAMBERLAIN said that they were faced with the fact that there was not a sufficient number of maternity homes. They wanted more to be provided, but there would be still greater difficulty in getting local authorities to build more maternity homes in future if they were faced with the prospect that when they had built them they were going to be a heavy charge on them because the authority would not be able to recover expenses from patients.

The amendment was negatived by 250 votes to 145.

Definition of Infectious Disease.

Mr. RENNIE SMITH moved an amendment providing that the term "infectious disease" in the clause should be declared to include tuberculous and venereal disease.

Sir KINGSLEY WOOD said that the Ministry had placed the amendment before their legal advisers, and they had stated that both tuberculosis and venereal disease could be regarded as coming within the meaning of the clause relating to infectious diseases, and that the amendment was therefore unnecessary.

Dr. VERNON DAVIES said that the Ministry of Health was taking a rather important step. If they were to say that the term infectious diseases was to include, in all cases, tuberculosis and venereal disease, how were they going to keep out infantile paralysis, encephalitis lethargica, and influenza?

The Chairman pointed out that the Minister had merely stated that these words as a matter of definition would include certain complaints.

Sir H. SLESSER said that there was no definition at all of infectious disease in the Bill. Sir Kingsley Wood had said that he was advised the the term infectious disease included tuberculosis. The position was very unsatisfactory. He wanted to know where the Committee stood in the matter of definition. Was there no Act that defined infectious disease? If so, the Bill ought to be redrafted so as to say that the words "infectious disease" here had the meaning attached to them in some other Act. Or did the right hon. gentleman mean that as a question of medical fact infectious disease included these particular things?

Sir T. INSKIP (Attorney-General) said that the Committee never needed legal arguments if a little common sense would solve the problem. Fortunately, most of them understood the English language, and the words "infectious disease" were not a term which lawyers used and which required an interpretation Act. They were words which meant that a disease was infectious and, that so long as people suffering from it were at large, might result in injury to other persons. The result was that people who suffered from what were, in fact, infectious diseases were required in the public interest to go into an institution for treatment. The question was, what were in fact infectious diseases? Everyone agreed that tuberculosis and venereal diseases were, in fact, infectious diseases. Then the question was as to whether some other diseases were not infectious diseases. They would not arrive at a solution of this question merely by putting in the words "tuberculosis and venereal disease," because by including some words they tended to exclude others. It was better to leave the question of what was an infectious disease to be solved by proper evidence of fact, if ever such a question arose; and he had very little doubt that those questions of fact would be solved by the common sense of the doctors and authorities without any necessity to resort to a court of law.

Lieut.-Colonel FREMANTLE said that he dissented from the reading which the Attorney-General had just given. He could foresee his colleagues of the medical profession having to administer this measure, and they must know what cases they were dealing with, and what cases they were not dealing with under it. In the ordinary terminology of public health, the phrase "infectious disease" had a definite meaning. It was defined by an Order of the Ministry of Health interpreting certain Acts of Parliament in relation to infectious diseases. There was a specific catalogue of the diseases which were included in this definition. It was easy to administer a measure of this kind on those lines, but if his hon. and learned friend had the good fortune to belong to the medical instead of the legal profession, and if he, as a medical officer, had to try to work the administration of Acts relating to infectious diseases on the lines which he himself had suggested, he would find it an impossible task. They must have it laid down what diseases were to be regarded as infectious diseases. For practical purposes, venereal disease was not called an infectious disease, and certainly nobody had ever suggested that cancer was an infectious disease. He (Colonel Fremantle) suggested that the Minister of Health might reconsider this question in order to insert in the definition clause something defining the words "infectious disease" as being definitely associated with the term as generally interpreted in other Acts.

Sir KINGSLEY WOOD, after further discussion, said it was not a question of his own opinion but of fact as to whether a disease was infectious or not. If his own opinion was of any value he should say certainly tuberculosis would be included, but that was only his opinion. The advice given to the Department was that the amendment was unnecessary.

The amendment was negatived by 258 votes to 145. Under the guillotine resolution the clause was agreed to by 270 votes to 147. Clauses 18 to 27 in Part II. of the Bill were afterwards agreed to on a division under the guillotine, without discussion. Clause 18 provides for the transfer of the functions of the guardians under the Registration Acts to the county councils and county borough councils. Clause 21 provides that the councils shall prepare schemes for the administration of the Registration Acts, and Clause 23 amends the law in regard to the method of giving information of birth or death. Clause 24 applies this part of the Act to London with certain modifications. In Part III. of the Bill, Clause 26 deals with roads and town planning. After Clause 28 had been passed, dealing with the transfer of classified roads in urban districts to the county council, the Committee stage was adjourned until the following day.

Medical News.

UNIVERSITY OF LONDON.—At recent examinations the following candidates were successful:—

M.D.

Branch I. (Medicine.)—Susanna M. Bernard and Kathleen M. Bowman-Manifold, London (R.F.H.) School of Medicine for Women; J. W. Brown, Middlesex Hosp.; W. F. Gaisford, St. Bart.'s Hosp.; Lazarus Hartston, London Hosp.; *Horace Joules, Middlesex Hosp.; Maurice Mitman, Guy's Hosp.; H. S. Morley, Univ. Coll. Hosp.; Marie Pedersen, and Muriel F. Prout, London (R.F.H.) School of Medicine for Women; W. E. Rees, St. Thomas's Hosp.; B. B. Sharp, St. Bart.'s Hosp.; A. S. Wesson, Univ. Coll. Hosp.; and W. S. Whimster, Guy's Hosp.

* University Medal.

Branch IV. (Midwifery and Diseases of Women.)—R. K. Ford, London Hosp.; M. E. MacD. Jago, Guy's Hosp.; Lucy Parker, London (R.F.H.) School of Medicine for Women; and H. W. Parrott, London Hosp.

Branch VI. (Tropical Medicine.)—A. N. Kingsbury, Middlesex Hosp. and London School of Tropical Medicine; and J. N. Leitch, St. Bart.'s Hosp. and London School of Tropical Medicine.

At a meeting of the Senate on Dec. 19th, 1928, it was resolved to institute a university chair of anatomy tenable at St. Thomas's Hospital Medical School.

The degree of Ph.D. (Biochemistry) was conferred on William James Griffiths, of St. Thomas's Hospital, for a thesis on Gastric Secretion.

Forthcoming Lectures.—The following lectures will be delivered, unless otherwise stated, at University College, Gower-street, London: Three on the Hygiene of the Mercantile Marine, by Dr. J. Howard-Jones, M.O.H. for Newport, at 5.30 P.M. on Fridays, Feb. 22nd and March 1st and 8th; three on the Properties of, and Methods of Estimating, some Therapeutic Agents, by Dr. J. H. Burn, at 5 P.M. on Feb. 27th and 28th, and March 1st; six, with demonstrations, on Cytology in Relation to Physiological Processes, by Dr. R. J. Ludford, at 5 P.M. on Thursdays from Jan. 24th to Feb. 28th; three on Fatigue, by Dr. G. P. Crowden, at 5 P.M. on Mondays, Jan. 14th, 21st, and 28th; six on the Physiology of Reproduction, by Mr. A. S. Parkes, D.Sc., at 5 P.M. on Wednesdays, Jan. 16th to Feb. 20th; ten on Comparative Physiology, by Mr. C. F. Pantin, at 5 P.M. on Fridays, Jan. 18th to March 22nd; three (in English) on Some Questions of Tropical and Local Helminthology, by Prof. F. Fülleborn, of Hamburg, at 5.30 P.M. on March 11th, 12th, and 13th, at the London School of Hygiene and Tropical Medicine; and three on the Eye in General Medicine, by Dr. A. Maitland Ramsay, at 5.30 P.M. on March 4th, 6th, and 8th, at University College Medical School.

A course of public lectures on the Current Work of the Biometric and Eugenics Laboratories will be given at University College at 5.30 P.M. on Tuesdays, from Jan. 29th to March 5th. The lecturers will be Prof. Karl Pearson, F.R.S., Dr. Julia Bell, Mr. G. M. Morant, D.Sc., Miss Ethel Elderton, and Dr. Percy Stocks. The lectures will be open to the public without fee.

ROYAL MICROSCOPICAL SOCIETY.—The annual meeting of this society will be held in the Lecture Hall at 20, Hanover-square, London, W., on Wednesday, Jan. 16th, at 7.45 for 8 P.M., when Mr. Joseph Barnard, F.R.S., will deliver a presidential address on Some Aspects of Ultra-Violet Microscopy.

BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—At 18, John-street, Adelphi, London, W.C., on Tuesday, Jan. 15th, at 8.15 P.M., Mr. Roger Fry will lecture on Representation in Art.

COMMITTEE ON OCCUPATIONAL DISEASES.—The fourth meeting of the Permanent International Committee on Occupational Diseases will open at Lyons on April 3rd. The chief subjects of discussion will be Silicosis, Cataract of Occupational Origin, and the Endocrine System and Poisonings. Those desirous of taking part in the meeting must be introduced by a titular member of the committee or by the executive or the Organising Committee. The secretary is Dr. Mazel, 54, avenue de Noailles, Lyons.

ASTLEY-AINSLIE INSTITUTION.—The governors of this Edinburgh institution have appointed Lieut.-Colonel John Cunningham, I.M.S., to be its medical superintendent. Colonel Cunningham, who is a son of the late Prof. D. J. Cunningham, professor of anatomy in the University of Edinburgh, graduated M.B. Dub. in 1904, and is at present director of the King Institute of Preventive Medicine, Guindy, Madras. He was formerly assistant director of Central Research Institute, Kasauli. He has contributed various articles on clinical medicine to medical publications. He will take up his duties in the spring of this year, when the extended buildings will be completed.

THE death is announced of Dr. Maurice E. J. L. Letulle, sometime professor of clinical medicine in the University of Paris, at the age of 75. Prof. Letulle had been a member of the Academy of Medicine since 1908, and was the author of several standard works on pathological and clinical subjects.

OPTICAL SOCIETY.—A meeting of this society will be held at the Imperial College of Science and Technology, South Kensington, at 7.30 P.M., on Thursday, Jan. 17th, when a paper on the Function of the Lens Capsule in the Accommodation of the Eye will be read by Mr. E. F. Fincham, and papers on a Double Reflexion Level and Photographs of Reflexion Caustics by other members.

SOCIETY OF M.O.H.'S AND MEDICO-LEGAL SOCIETY. A joint meeting of the Medico-Legal Society and the Maternity and Child Welfare Group of the Society of Medical Officers of Health will be held at 8.30 P.M. on Thursday, Jan. 24th, at 11, Chandos-street, London, W, with Sir William Willcox, president of the Medico-Legal Society, in the chair. A discussion on Criminal Abortion and Measures Necessary to Restrict the Sale of Abortifacient Drugs will be opened by Dr. F. J. McCann, Dr. R. A. Lyster, Sir Bernard Spilsbury, Mr. H. Beckwith Whitehouse, and Mr. H. D. Roome. Members of either Society may introduce guests to the meeting.

POST-GRADUATE COURSES AT ROYAL NORTHERN HOSPITAL.—As announced last week a series of courses on special subjects will begin at this hospital on Jan. 28th. The first course on Gastro-enterology starts on this date, and during the subsequent fortnight 14 lectures will be devoted to the medical, surgical, radiological, and pathological aspects of the subject. It will be treated primarily from the standpoint of the practitioner. Applications, together with the fee of £2 2s., should be lodged with the Secretary of the hospital (Holloway-road, London, N. 7), not later than Jan. 21st. If there are less than six applicants applying no course will be held. Detailed programmes of this and other courses may be had from the Dean.

ORDER OF ST. JOHN OF JERUSALEM.—The following promotions and appointments have been made: Colonel Sir James R. A. Clark, Bailiff Grand Cross, from Knight of Justice; Colonel J. A. Dick and Dr. C. C. Lavington, commanders; Major F. Howard Humphris, Dr. A. G. Osborn, Dr. W. E. Thomas, Lieut.-Colonel Sir George W. Badgerow, Sir Percival Horton-Smith Hartley, and Sir Wilfred T. Grenfell, officers; Dr. J. R. Summers Park, Dr. James Pirie, Dr. Charles H. Perram, Dr. H. J. Ley, Dr. J. A. MacKenzie, Dr. William Megaw, Dr. J. R. H. Dubourg, Dr. John Orr, Dr. William Arnott, Dr. A. Oliver Holbeche, Dr. Christopher Armstrong, and Dr. John M. Wilson, Serving Brothers; and Dr. Simon Simons, Associate Serving Brother.

UNIVERSITY OF GLASGOW.—Prof. Andrew Hunter, of Toronto, has been appointed to the Gardiner Chair of Physiological Chemistry, rendered vacant by the promotion of Prof. E. P. Cathcart to the Regius Chair of Physiology.

Graduating M.B. with first-class honours at the University of Edinburgh in 1901, Dr. Hunter carried out post-graduate work at Berlin and Heidelberg, and after working for a time in Edinburgh was appointed assistant professor of biological chemistry at Cornell University, U.S.A. Later he was appointed to the chair of biological chemistry in the University of Toronto. He is expected to take up residence in Glasgow early in the New Year. His colleague at Toronto, Prof. J. J. R. Macleod, F.R.S., was recently appointed to the Regius chair of physiology at Aberdeen.

PEOPLE'S LEAGUE OF HEALTH.—On Jan. 18th this League will begin a series of 12 Sims Woodhead health lectures. The lectures will be given weekly at the rooms of the Medical Society of London, 11, Chandos-street, W., at 6 P.M., the subjects and speakers being as follows:—Jan. 18th: The Need for a National Stocktaking, Mr. C. J. Bond; 25th: Bones, Muscles, and Internal Organs, Prof. H. E. Roaf; Feb. 1st: Glands, Circulatory, and Respiratory Systems, Prof. M. S. Pembrey, F.R.S.; 8th: Brain and Nervous System, Sir Robert Armstrong-Jones; 15th: Lymphatics, Lymphatic Glands, and Digestive System, Prof. B. Collingwood; 22nd: Nutrition and Protective Foods and Excretory System, Prof. V. H. Mottram; March 1st: Human Faculties, Dr. Thomas Beaton; 8th: Water, Air, Light and Ventilation, Dr. Leonard Hill, F.R.S.; 15th: Growth and Development of Mind and Body, Dr. R. D. Gillespie; 22nd: Youth, Adolescence, and Adult Life, Mr. Z. F. Willis; April 12th: Natural Capacity and Health in Relation to a Career, Sir Thomas Oliver; 19th: Decay and Disease, Natural and Premature, Dr. C. C. Worster-Drought. Full particulars may be had from the headquarters of the People's League of Health, 12, Stratford-place, London, W. 1.

THE death is announced of Miss Caroline Helen Keer, R.R.C., late matron-in-chief of Queen Alexandra's Imperial Military Nursing Service, at the age of 71. She was the second daughter of Major-General Keer and joined the Army Nursing Service in 1887.

VICTORIA INFIRMARY, GLASGOW.—A new departure in connexion with hospital treatment in Glasgow is contemplated by the governors of the Victoria Infirmary, who intend to erect an annexe to their establishment for the accommodation of paying patients. Costing about £25,000 the new structure will have accommodation for some 30 patients, but provision will be made for further extensions. Patients of the annexe will receive the same treatment as is given in the ordinary wards, and will be asked to pay six guineas per week, inclusive, for the first three weeks and half that charge per week thereafter.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A new series of demonstrations will be given at the Wellcome Museum of Medical Science, 33, Gordon-street, London, W.C., on Wednesday, Jan. 16th at 4.30 P.M., when Dr. Helen Mackay will speak on Some Recent Work on Rickets. No fee will be charged for this demonstration. A new series of lectures, entitled Pitfalls in Medicine and Surgery, will start on Monday, Jan. 21st at 5 P.M., at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, with a lecture by Dr. Robert Hutchison on Pitfalls in Diagnosis of Dyspepsia. The weekly demonstrations in medicine and surgery will be resumed shortly at the various London general and special hospitals. A full list of lectures and demonstrations for the next three months may be had on application. Two courses begin on Jan. 14th and continue for two weeks. These are an intensive course in cardiology at the National Hospital for Diseases of the Heart, and an all-day course at the Queen's Hospital for Children. From Jan. 28th to Feb. 9th an intensive course in medicine, surgery, and the specialties will take place at the Prince of Wales's General Hospital, Tottenham. On Tuesdays and Saturdays, at 11 A.M., from Jan. 29th to Feb. 23rd, a series of lecture-demonstrations in psychological medicine will be given at the Bethlem Royal Hospital by Dr. Porter Phillips and members of the staff. Copies of all syllabuses and information about the general course arranged by the Fellowship may be had from the Secretary at 1, Wimpole-street, W. 1.

THE death is reported of Dr. Johannes von Kries, for many years professor of physiology in the University of Freiburg in Breisgau. He was best known as a physiologist by his many interesting experiments to elucidate the phenomena of colour vision and by his studies on physiological optics. With his brother he worked in C. Ludwig's laboratory in Leipzig in the 'seventies. He devised ingenious direct experiments confirming and extending the observation of Arago that certain small stars, which are visible at the periphery of the retina by indirect vision, are not visible by direct vision—i.e., when their image falls on the fovea centralis. He extended the "duplicity theory" of Max Schultze, that the cones of the retina subserve light and colour perceptions, while the rods are concerned with the perceptions by light, but are incapable of initiating colour sensations. The observations of Parmaud and more especially those of von Kries gave a wider basis to Max Schultze's theory—founded on his classical microscopic observations—on the structure of the retina in 1866, as to the distribution of the rods and cones in the retina of man and animals. Von Kries assumed that the rods act as the receptors in scotopic or twilight vision, while the cones, particularly those of the fovea, are the organs of photopic vision.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Jan. 15th.—5 P.M., MEDICINE. Dr. F. Parkes Weber: Endocrine Tumours. Dr. O. Leyton: How Can we Decide that a Case of Glycosuria should be Treated. The papers will be followed by discussions. 5.30 P.M., GENERAL MEETING OF FELLOWS. Ballot for election to the Fellowship. 8 P.M., PATHOLOGY. Communications: H. Warren Crowe: The Experimental Production of Foci of Infection in Rabbits and its Bearing on Osteo-arthritis. B. J. W. Jervis and R. B. Bourdillon: Treatment of Experimental Anæmias with Ultra-violet Light. Demonstrations: W. G. Barnard: Secondary Carcinoma Infiltrating a Uterine Fibroid. W. D. Newcomb: Carcinoma of Small Intestine.

WEDNESDAY.—5 P.M., SURGERY: SUBSECTION OF PROCTOLOGY. Clinical Pathological Meeting.
THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Dr. J. H. T. Davies: (1) Pigmentation of the Face—for Classification. (2) Case for Diagnosis—? Fox-Fordyce Disease. Other cases will be shown.
FRIDAY.—8 P.M., PATHOLOGY, SURGERY, OBSTETRICS. Special Discussion on Post-operative Thrombosis. Openers: W. Howel Evans (Pathology), D. H. Patey (Surgery), Victor Bonney (Obstetrics). 8.30 P.M., ELECTRO-THERAPEUTICS. Papers: Mr. C. Thurstan Holland: Epiphyseal Injuries of the Wrist-joint. Dr. R. S. Patterson: Some Factors Influencing Epiphyseal Growth and Union.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Jan. 14th.—8 P.M., Pathological Evening.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W.
THURSDAY, Jan. 17th.—8.15 P.M., Mr. Edward Hindle, Ph.D.: An Experimental Study of Yellow Fever. Chairman: Prof. J. W. W. Stephens, F.R.S. (Preceded at 7.45 P.M. by a demonstration of microscope slides and specimens to illustrate the subject.)

CHELSEA CLINICAL SOCIETY.
TUESDAY, Jan. 15th.—8.30 P.M., at St. George's Hospital. The following will show cases or specimens; Mr. L. Abel, Mr. Ivor Back, Dr. H. MacCormac, Dr. J. Moore, Dr. Orlianski, and Dr. C. Sundell.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Jan. 14th, to SATURDAY, Jan. 19th.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4.30 P.M., Dr. Helen Mackay: Some Recent Work with Regard to Rickets. No fee. NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W. Intensive Course in Cardiology, lasting two weeks. QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. All-day Course for two weeks. Further information from the Secretary.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Jan. 14th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Jan. 15th.—5 P.M., Dr. A. C. Roxburgh: Eruptions Due to Physical Causes.
THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Ringworm Infections.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
MONDAY, Jan. 14th.—1.30 P.M.: Methods of Examination and Diagnosis Courses. Mouth and Pharynx.
WEDNESDAY.—1.30 P.M.: Larynx.
FRIDAY.—4 P.M., Dr. Dan McKenzie: Early Mastoid Operations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Jan. 15th.—3.15 P.M., Dr. A. Lisle Punch: Demonstration of Chest Cases.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE, Manchester.
FRIDAY, Jan. 18th.—4.30 P.M. (at the Whitworth-street West Branch), Dr. Lacey: Ante-partum Hæmorrhage.

SHEFFIELD UNIVERSITY POST-GRADUATE CLINICS.
FRIDAY, Jan. 18th.—3.30 P.M. (at the Royal Hospital), Prof. Hall: Clinical Cases.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150
Brighton, Royal Sussex County Hospital.—Jun. Asst. Pathologist. £250. Also Hon. Medical Clinical Asst. Also H.S. £150.
Cape Town University.—Asst. in Pathological Chemistry. £800.
Cardiff City Mental Hospital, Whitchurch, near Cardiff.—Med. Supt. £1000.
Cardiff, Royal Infirmary.—Three H.S.'s. Also Three H.P.'s. Each at the rate of £50.
Chester, Royal Infirmary.—Third Hon. Surgeon.
Exeter City Mental Hospital.—Asst. M.O. £350.
Exeter, Royal Devon and Exeter Hospital.—H.S. Also Asst. H.S. At rate of £130 and £100 respectively.
Great Yarmouth, General Hospital.—H.S. £150.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. £300. Also Anæsthetist. 15 gns.
Ilford Emergency Hospital, Ilford, Essex.—Jun. H.S. £100.
Leicester Royal Infirmary.—Surgical Dresser. 10s. 6d. weekly.
Leigh Infirmary, Lancashire.—Res. H.S. At rate of £150.
Liverpool, Royal Liverpool Children's Hospital, Myrtle-street.—Res. Cas. O. £120. Also Two Res. H.P.'s and Two Res. H.S.'s. Each at rate of £60. Also Res. M.O. for Heswall Branch. At rate of £120.
L.C.C., Mental Hospital Service.—Eighth Asst. M.O. £300.
London Hospital, E.—Dental Anæsthetist.
London Temperance Hospital, Hampstead-road, N.W.—Med. Reg. 40 guineas.
Malayan Medical Service.—Medical Officers. £700 per annum.
Manchester, Ancoats Hospital.—Res. M.O. £150.
Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.
Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. At rate of £150.
Northampton General Hospital.—Hon. Pathologist.
Nottingham, City Mental Hospital.—Jun. Asst. M.O. £350.
Oldham, Royal Infirmary.—H.S. At rate of £175.
Paddington Green Children's Hospital, W.—Two Hon. Surgeons.
Portsmouth, Royal Portsmouth Hospital.—Cas. O. At rate of £100.
Princess Louise Kensington Hospital for Children, N. Kensington. H.S. At rate of £75.
Queen's Hospital for Children, Hackney-road, E.—Asst. Surg.
Reading, Royal Berkshire Hospital.—Hon. Asst. Physician.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Royal Army Medical Corps.—Twenty-five Commissions. £500 to £2000.
St. Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.
St. Marylebone General Dispensary, 30, Marylebone-lane, W.—Clin. Asst. in Ultra-violet Radiation Department.
Sheffield Royal Hospital.—Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.
South-Eastern Hospital for Children, Sydenham, S.E.—Asst. Res. M.O. Honorarium £75.
Stoke-on-Trent, North Staffordshire Royal Infirmary, Hartshill.—Hon. Asst. Physician.
Wallasey, Victoria Central Hospital.—Jun. H.S. £100.
West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Sen. H.P. Also Jun. H.P. At rate of £150 and £100 respectively.
West London Hospital, Hammersmith-road, W.—Aural and Ophth. H.S. and Res. Asst. Cas. O. At rate of £100.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Anæsthetist. £200. Also Specialist Consultants. Special Fees.
Willesden General Hospital.—Clinical Assistants.
Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Roade (Northants) and at Lockerbie (Dumfriesshire).

Births, Marriages, and Deaths.

BIRTHS.

LLOYD.—On Jan. 2nd, at Hereford-square, Kensington, the wife of Eric I. Lloyd, F.R.C.S., of a son.
OSBOURNE.—On Jan. 5th, at Watford, Herts, the wife of Denis Osbourne, M.B., Ch.B., of a daughter.
STRUTHERS.—On Jan. 2nd, the wife of J. A. Struthers, M.B., M.R.C.P., of Fortune Green-road, N.W., of a son.
VINES.—On Jan. 5th, at Wyndyate, Chalfont St. Peter, Bucks, the wife of H. W. C. Vines, M.D., of a son.

MARRIAGES.

KERLEY—MCNAMEE.—On Jan. 2nd, at University Church, Dublin, Dr. Peter Kerley, Weymouth-street, London, to Olivia McNamee, Enniskillen.
WALLACE—BEVINGTON.—On Jan. 1st, quietly in London, Lieut.-Colonel John Wallace, R.A.M.C.T., to Margaret Chieslie (Madge) Bevington.

DEATHS.

BOYS. — On Jan. 7th, at St. Peter's-street, St. Albans, Arthur Henry Boys, M.R.C.S., L.R.C.P., aged 77.
COOK.—On Jan. 1st, of pneumonia whilst on a visit to his son at Isleworth, Joseph B. Cook, M.R.C.S. Eng., L.R.C.P. Edin., of Parkdene, Great Missenden, Bucks, in his 81st year.
DOUGLAS. — On Dec. 31st, 1928, at Mundesley, Norfolk, Arthur McDonald Douglas, M.B., Ch.B., in his 31st year.
RUSSELL.—On Jan. 2nd, at St. Mawes, Wilfred Alan Russell, M.B. Camb., M.R.C.S., L.R.C.P., late R.A.M.C., of the Little House, Mayford, Surrey.
WRIGHT.—On Jan. 4th, at Lennox-mansions, Southsea, from pneumonia, John Lister Wright, M.R.C.S.E., L.R.C.P.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET,"
VOL. II., 1928.

THE Index and Title-page to Vol. II., 1928, which was completed with the issue of Dec. 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

IODINE IN RELATION TO GOITRE.*

By D. W. CARMALT-JONES, M.D. LOND., F.R.C.P. LOND.,

PROFESSOR OF SYSTEMATIC MEDICINE, UNIVERSITY OF OTAGO, NEW ZEALAND; CONSULTING PHYSICIAN, WESTMINSTER HOSPITAL.

PART I.

IODINE was discovered by Courtois in 1812. Its distribution in air, water, soil, food, and elsewhere was very fully worked out by Chatin between 1850 and 1860. This must have been very remarkable work, the quantities in which the element is present in most substances in Nature is exceedingly minute, and very accurate colour tests are required for its estimation, but in a recent survey by von Fellenberg, a Swiss chemist, Chatin's results were confirmed in almost all particulars. In all physiological and pathological relations a recognition of the minute quantity involved is essential to the comprehension and correct handling of the problems.

Iodine is constantly present in the mammalian thyroid gland. This was first demonstrated by Baumann in 1896, since when much study has been devoted to the association between the two. Oswald (1901) showed that it was present in the colloid portion, and a few years later (1909) Marine and Lenhart established a kind of corollary to this, and showed that the amount of iodine in any thyroid varied inversely with the amount of hyperplasia. Marine and Rogoff (1916), by perfusion experiments into a dog's vein, demonstrated the remarkable affinity of the thyroid for iodine. Fifty milligrammes of potassium iodide injected into a dog's vein increased the iodine content of the thyroid by several hundred per cent. within five minutes. It is highly probable that the internal secretion of the thyroid gland contains iodine, and in 1916 Kendall claimed to have isolated this hormone in crystalline form with an empirical formula showing the presence of iodine; he called this body "thyroxin." More recently Harrington has isolated another body which most physiologists are more willing to accept as representing the thyroid hormone. Iodine therefore appears to be an essential element in the internal secretion of the thyroid gland, and as such is essential to health, since the removal of the thyroid is followed by grave results to many vital processes. The thyroid gland is known to have many important functions, one of which is the control of the basal metabolic rate (B.M.R.). This is of great experimental importance, since the rate is capable of measurement. In myxœdematous patients and cretins, in whom the thyroid gland is either atrophied or hypoplastic and so contains little colloid or iodine, the B.M.R. is low, and in cases of Graves's disease, in which the thyroid is much enlarged and which can be successfully treated by partial removal of the gland, the B.M.R. is high. It is therefore assumed that in cretins the secretion of the iodine-containing thyroid hormone is inadequate, and in cases of Graves's disease it is excessive. Further, the B.M.R. is assumed to be a measure of the secretion of thyroxin. There are thus very good grounds for the view that the activity of the thyroid gland is essentially concerned with the metabolism of iodine.

If iodine is introduced into the circulation it is rapidly taken up by the thyroid, as Marine and Rogoff showed, and the total amount of iodine in the normal thyroid is estimated at between 1 and 2 mg. per gramme of dried substance, with a total of 25 mg. for the whole gland. The amount of iodine in the normal thyroid is thus about 0·1 per cent. of dried substance, and it is further estimated that 10 mg. of iodine must be ingested per annum to maintain this concentration. This supply must be derived from food and water, and the amount present in either of them is exceedingly minute. There is very little in meat, so that the amount in the circulating blood is likely to be very small. The point requires emphasis, because the whole problem of iodine in relation to goitre depends upon the extremely minute quantity of iodine which is commonly required and commonly available for the activities of the thyroid gland. This may be more fully grasped if a comparison is made between the physiological status of sodium chloride and that of iodine in the animal body, with a brief consideration of the development of the vertebrate mammal from the invertebrate marine animal.

* Being the substance of a lecture delivered at the Institute of Pathology and Research at St. Mary's Hospital. Part II. will appear next week.

The latter has an excretory system which communicates directly between the body cavity and the surrounding sea-water, consequently the saline constituents of the body fluid are identical with those of sea-water. Sea-water contains 3·5 per cent. of salts, of which the great majority is sodium chloride, and 0·000002 parts per cent. of iodine, or, in the usual way of describing such minute amounts, 2 parts per 10^7. Vertebrate mammals, derived originally from marine invertebrates, retain a body fluid of similar saline constituents to those of sea-water, but diluted about five times: thus the sodium chloride content of the body fluid is about 0·75 per cent. If the same holds good of iodine, the content of the body fluid should be about 4 parts to 10^7. Whatever, therefore, the actual iodine content of the thyroid gland, the amount which it puts into circulation seems to be exceedingly minute. It is well known that land animals require sodium chloride, derived from some marine source, to be added to their food, and that it is a regular addition to the diet of civilised man. It is therefore easy to understand that if the essential minute amount of iodine is not present in natural food it must be deliberately added. The sea is not, however, the common source of iodine as it is of sodium chloride: in most countries an adequate amount is present in the soil, where it appears to be derived chiefly from igneous rocks. At the same time it is obtainable from the sea, and eaters of sea-fish, particularly of shell-fish, ingest iodine in relatively large amounts. Iodine is present in soil, from which it is taken up by vegetables, and it is from these that animals derive it. Animal food, whether milk or flesh, which has been raised on vegetables with a sufficient iodine content is itself a source of iodine. But the amounts actually present both in soil and food are exceedingly minute. The content of iodine in soils is measured in parts per 10 million (10^7), which is approximately the same as measuring the number of grains to the half ton. The unit of weight commonly employed is the microgramme (Gamma, γ), one-thousandth part of a milligramme, or one-millionth part of a gramme. There are about 60,000 γ to a grain. The iodine content of foodstuffs is measured in γ per kilo, which is the same as parts per 1000 million (10^9). The figures to be quoted are from papers by Hercus, Benson and Carter, and by Hercus and Roberts, and the observations were made on New Zealand material. The richest soil in New Zealand (Taranaki contains 166 parts of iodine per 10^7, and the average content of various foodstuffs, not grown in Taranaki but in several non-endemic districts, is as follows:—

Root vegetables, without skin and unmanured	7	parts per 10^9.
Leafy vegetables, unmanured	24	
White flour	3	
Oatmeal	30	
Beef	13	
Mutton	10	

It is upon the iodine so derived that the thyroid depends for the 10 mg. or 10,000 γ which it requires annually, and which, it will be seen, involves an intake of about 200 γ a week, or about 30 γ a day.

Results of Living on a Soil Deficient in Iodine.

Briefly, it is assumed that the thyroid gland requires 30 γ of iodine daily for its hormone; this iodine it derives from the food, the iodine content of which depends on the presence of iodine in the soil. It is evident that if the soil of any district is deficient in iodine, then the animals which live in the district will be placed at a certain disadvantage in regard to the activities of their thyroid glands. The thyroids, so long as they remain healthy, will attempt to adapt themselves to the conditions in which they are placed, and if they fail to adapt themselves they will show symptoms of disease of one kind or another—that is to say, their functions will be disturbed either by way of excess or defect. It happens that this condition of deficient iodine in the soil is found in many districts in New Zealand, with the result that simple, or endemic, goitre is highly prevalent. This is to be regarded as the response of healthy thyroids to a particular physiological stress. The enlarged gland, however, is unusually vulnerable, and a proportion of the cases become "toxic"—i.e., show to excess the functions of thyroid action, among them an increased B.M.R. Others atrophy, either with or without a toxic period, and show defective thyroid action, up to complete myxœdema, with decreased B.M.R.

These observations were, of course, made in the reverse order from that just given. Goitre has long been observed in New Zealand, and it is only recently that deficiency of iodine in the soil has been recognised as its cause. This discovery is, in fact, the outcome of the most important piece of medical research yet done in the country. Whether the New Zealand results are applicable to other countries where goitre is prevalent I have no means of knowing, but iodine deficiency appears to be the essential cause of New Zealand goitre. Doubtless, with thyroids rendered sensitive by this

means, any of the other numerous causes of goitre may be particularly effective in individual cases. The relation of iodine deficiency in New Zealand has been established by the following steps. Goitre has been prevalent among New Zealand Maoris living in inland districts for as long as tradition goes back. Coastal Maoris, who were and are large fish-eaters, naturally escaped, but in 1925 Hercus found an incidence of 18 per cent. in the only inland tribe so far investigated, the Urewera. In the South Island of New Zealand serious European occupation began between 1840 and 1850, and in 1880 Dr. Hacon, the medical superintendent of the Christchurch Mental Hospital, found a considerable incidence of goitre among his patients and their attendants, and recorded the birth of a child with goitre, and the occurrence of Graves's disease. Hacon attempted to establish the prevalence of goitre throughout the country by means of a questionaire addressed to doctors—a disappointing method—but found at least that there was great variation in the incidence in different parts of the country, Canterbury being then, as now, the most affected district. He published his results in 1892. In 1910 Colquhoun published further observations on similar lines with a spot-map of affected areas. He consulted expert opinion as to the geological character of the districts, but nothing was at that time found which was common to the areas of goitre prevalence.

During the period of the Great War no less than 1500 men out of 130,000 examined were rejected for military service on account of goitre; of these, 1000 were in the Christchurch Military District. Meantime, the importance of iodine to the thyroid gland was gradually becoming established and, in 1916 Drennan, who was familiar with Marine's work, was appointed to the chair of pathology at Otago University. He was at once impressed with the prevalence of goitre as seen in the streets, the hospital, and the post-mortem room, and in 1919 he advised the assay of foodstuffs for iodine, since the conditions in New Zealand appeared to be closely similar to those described by Marine in the Great Lakes district of America. Marine had successfully treated by iodine trout with goitre, pigs born with goitre when the mothers' food was deficient in iodine, and school-girls with endemic goitre. Drennan had found in New Zealand goitrous trout, lambs born with goitre, and a high incidence of goitre among young people. Goitre is to be found in New Zealand among animals both domesticated and wild, among cattle, sheep, horses, and trout; the observations on animals are not yet complete.

The iodine factor in endemic goitre in New Zealand was first seriously investigated by Hercus, who returned to New Zealand after five years' absence during the war, and entered the Public Health Service, which includes the inspection of school-children. He was as impressed as every newcomer with the prevalence of the condition, which rouses little interest in the permanent resident, and he proceeded, with Dr. Eleanor Baker, to investigate the incidence among school-children in Canterbury and Westland. They obtained the remarkable figure of 60 per cent., most of it incipient. These observations were extended by Dr. Baker to the whole country, including some 90,000 persons, and gave a total of 34 per cent. for all children of school age. Great pains were taken by Dr. Baker to secure uniformity in the method of examination and estimation. Many of these juvenile goitres disappear, but it may be noted that many goitrous children have goitrous parents and siblings, and that in the Christchurch Maternity Hospital some 60 per cent. of the mothers are goitrous and 8 per cent. of the babies born have goitre.

There are many supposed causes of endemic goitre, but the only one which Hercus could find applicable to the condition as it occurs in New Zealand is deficiency of iodine in the soil. His attention was first drawn to this as a probable cause by observations made in Canterbury, in the city of Christchurch, and the neighbouring port of Lyttelton, in both of which the water-supply is artesian. The goitre incidence among school-children in Christchurch was 64 per cent., whereas in Lyttelton it was 20 per cent. lower. The Lyttelton water-supply is slightly contaminated with sea-water, and it occurred to Hercus that the trace of iodine so introduced might be responsible for the difference in the goitre incidence, and that in this case the soil was likely to be of greater importance than the water-supply as a source of iodine. This led ultimately to an investigation of the iodine in the soil of the districts throughout the country, together with a record of the goitre incidence in the school-children in the same areas.

INQUESTS IN MANCHESTER.—The number of deaths reported to the city coroner of Manchester in 1928 was 1296, as against 1274 in 1927. 473 inquests have been held, compared with 546 in 1927, the decrease being due to the Coroner's Amendment Act. Under the old Act 612 inquests would have been necessary.

NORTON THE ALCHEMIST.

TRADITION places the beginning of chemical study in Europe in 1144, when Robert of Chester completed his translation from the Arabic of the "Book of the Composition of Alchemy." This science lent itself more than most to knavery, magic, and occultism; but there were honest men among its exponents, and among them we must place Thomas Norton of Bristol.[1] He seems to have been a pupil of G. Ripley, and medical students of to-day, struggling to acquire the rudiments of chemistry, may be heartened to know that Norton apparently learnt the whole science of alchemy in 40 days.

On his return to Bristol, stuffed with alchemical learning, the poor man had no luck. After an auspicious start in which he actually prepared the elixir of gold, he was chagrined at having it stolen by a dishonest servant. He next tried for the elixir of life, which, when prepared, he was most unfortunate in having stolen by a merchant's wife. The latter has been stated, on insufficient evidence, to be the wife of that William Canynges who rebuilt St. Mary Redcliffe. If this be so we can surely pardon the theft, annoying as it must have been to Norton, for as a memorial we have the most glorious parish church in England.

The authorship of the Ordinall is revealed by a curious acrostic; from the first word of the Proeme and the "initiall letters" of the six following chapters we get, with the first line of the seventh chapter, the following lines:—

TO-MAIS-NOR-TON-OF-BRISE-TO
A Parfet Master ye maie him call trowe.

The date of the manuscript is 1477. It has been very well reproduced here, both as to printing and illustrations, and can be commended to all who are interested in an out-of-the-way subject, and quaint diction. We are inclined to wonder whether Butler, in writing "Hudibras," had the Ordinall in mind when he wrote—

"Many rare pithy saws concerning
the worth of astrologic learning."

ACUTE CONGESTION AND ŒDEMA OF THE LUNGS.

ACTIVE congestion of the lungs is regarded by French authors as a primary condition, and is called by them the *maladie de Woillez*. In England and America, on the other hand, it is looked upon as symptomatic, and secondary to cardiac and pulmonary affections. The congestion may be generalised, as, for instance, in some types of cardiac disease or following the inhalation of irritating gases. Local or collateral congestion is seen in many pulmonary diseases such as pneumonia, pleurisy, bronchitis, and tuberculosis—the capillaries in the areas adjacent to the lesions being engorged and distended. As Osler points out, the symptoms of active pulmonary congestion are indefinite and difficult to distinguish from the anomalous or larval forms of pneumonia. The condition is fairly common, especially in children, in whom the only symptoms may be cough and fever persisting for a few days, with physical signs at one of the bases of the lungs of slight impairment of percussion note, distant breath sounds, and a few fine distant inspiratory crepitations. A radiogram of the chest shows at one base, and occasionally at the apex, a characteristic diffuse shadow which clears up as a rule in about one month from the onset. As the illness is usually very mild, the cases rarely, if ever, come to autopsy, and for this reason it is likely that the exact nature of the lesion will remain a subject for controversy.

Dr. G. Caussade and Dr. André Tardieu [2] have made an attempt, by clinical and histological examination of the sputum and lung fluid (withdrawn by exploratory puncture), to obtain some definite evidence by which Woillez's disease may be distinguished from the larval forms of pneumonia. With this in view they studied the symptoms, physical signs, and clinical course of three patients said to be suffering from it, and also carried out careful radiological, chemical, and histological investigations. The clinical pictures of the first two cases described resemble that of atypical lobar pneumonia, but the results of the microscopical and chemical examination of the sputum put the cases, in the author's opinion, definitely into the category of Woillez's disease. The greater part of the microscopic fields, after the specimens had been fixed with dilute chromic acid and stained with Unna's blue, were seen to consist largely of closely packed sero-albuminous droplets, with a few alveolar epithelial cells, polymorphs, streptococci, pneumococci, *Micrococcus catarrhalis*, and *M. tetragenus*

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[1] The Ordinall of Alchimy, written by Thomas Norton of Bristoll. Being a facsimile reproduction from Theatrum Chemicum Britannicum, with annotations by Elias Ashmole, with introduction by E. J. Holmyard, M.A., D.Litt. London: Edward Arnold and Co. 1928. Pp. 125. 10s. 6d.

[2] Ann. de Méd., 1928, xxiii., 413.

conglomeratus. No red blood cells or tubercle bacilli were seen. On chemical analysis the sputum was found to contain 0·71 per cent. of albumin. In the third patient, owing to the absence of expectoration, the lung fluid was examined, and on microscopical examination numerous sero-albuminous droplets were found, together with red blood cells, occasional polymorphs, and some alveolar epithelial cells in varying stages of hypertrophy and degeneration. Mixed with the latter were dust particles and some macrophages six times as large as a red cell. These macrophages were vacuolated, with an eccentric nucleus and contained partly digested alveolar cells. As all gradations between the alveolar epithelial cells and the macrophages could be seen, Caussade and Tardieu felt justified in assuming that the latter developed from the former. The common factor in all three cases, and in their opinion the characteristic feature of Woillez's disease was the presence of sero-albuminous droplets either in the sputum or in the lung juice. It is a pity that they did not give the results of the microscopical and chemical examination of the sputum of control cases of classical lobar pneumonia, because the absence of sero-albuminous droplets in such cases would have added greater weight to their statements. Again, the possible presence of atypical pneumonia cannot be excluded merely on account of an oscillation of 1° C. in the temperature chart, nor yet because bronchial breath sounds cannot be heard over the affected area, especially when, as in the third case, the absence of sputum is explained by blockage of the air-tubes by fibrinous plugs. If the bronchi are so firmly plugged as to prevent the expulsion of sputum, it seems quite likely that the entry of air into the bronchi would also be stopped and that breath sounds would not be heard over the consolidated area. On the whole it may be said that Caussade and Tardieu have not presented any convincing data by which the *maladie de Woillez* can be differentiated from the atypical pneumonias.

NATURALNESS IN THE SPEECH OF THE DEAF.[1]

THIS Essay is a detailed survey of the lines most likely to ensure success in teaching speech to deaf children. The author has tackled the subject with thoroughness, founding his views on a careful study and comprehensive grasp of the fundamentals of phonetics and voice production. Patient experimentation and years of practical, sympathetic experience render him an authority on the many questions of education, technique, and psychology that are involved.

The promotion of the quality of naturalness of speech in the deaf is of primary importance, for upon their approximately natural and fluent speech depends their ability to communicate with their fellow men. The subdivisions of the Essay show the many-sidedness of the subject dealt with—breathing, voice, speech sounds, accent, phrasing, rhythm, speed, intonation being some of them. To impart an accurate and useful grasp of some or all of these branches to a deaf child is no easy task, and young teachers need all the help obtainable from others of riper experience, gained through study and practice. Mr. Haycock provides a handy book of reference, and the Appendix contains useful exercises in connexion with the subdivisions. The exercises are by way of suggestions, and are open to extension or rearrangement according to the need of the children and feeling of the teacher.

The author stresses the necessity of making use of the natural emotions of pupils, and this is a feature that must not be overlooked. Short exclamatory sentences are invaluable in the cultivation and preservation of good pitch and elastic, rhythmic utterance. The mentalities and dispositions of children vary enormously, but expressions of joy or sorrow, excitement or boredom, like or dislike are common to all and are natural aids in teaching. Artificial aids—e.g., mirrors, a piano, sensitive flame—have their use. Mirrors Mr. Haycock would employ as a corrective; they are easily available and their use is often fascinating to the child. A piano is not so common in deaf schools, but has its uses when available. Deaf children early become sensitive to vibration, and Mr. Haycock puts forward suggestions as to how this can be utilised to correct pitch and intonation. He mentions Dr. Scripture's flame-trainer as of proven value in many cases, but points out that it requires a teacher fully trained and skilful in its use.

The Essay is a real addition to the books helpful in the study and practice of the teaching of speech to the deaf child, and we are not surprised to gather that its author was rewarded with the Braidwood gold medal by the National College of Teachers of the Deaf.

[1] How Best to Promote the Quality of Naturalness in the Speech of the Deaf so as to Ensure Easy Intelligible Oral Intercourse with Those who Hear. An Essay by G. Sibley Haycock. C. G. Goodwin, The Mount, Stoke-on-Trent. 1928. Pp. 60. Post free, 1*s*. 3*d*.

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 58.*)

THE following is the text of the official bulletins which have been issued during the past week and signed by Sir Stanley Hewett, Sir Hugh Rigby, and Lord Dawson of Penn:—

WEDNESDAY, JAN. 2ND. 8.15 P.M.

The King has passed a good day, and there is a slight improvement in His Majesty's condition.

THURSDAY, JAN. 3RD. 11.15 A.M.

The King has passed a restless night and there is no change to report in His Majesty's condition.

8 P.M. The King has had a fair day and there is no change to report in His Majesty's condition.

FRIDAY, JAN. 4TH. 11.30 A.M.

The King has had a quieter night; the local condition shows slight improvement, while the general condition remains stationary.

8.15 P.M. The King has had a quiet day. There is no change to report in His Majesty's condition. (Signed by Sir Stanley Hewett and Lord Dawson of Penn.)

SATURDAY, JAN. 5TH. 11.15 A.M.

The King has had a good night, and there is a slight improvement in His Majesty's condition.

8.30 P.M. In spite of a restless day, the King's condition remains unchanged. No bulletin will be issued until to-morrow evening. (Signed by Sir Stanley Hewett and Lord Dawson of Penn.)

SUNDAY, JAN. 6TH. 8.15 P.M.

The King has had a quiet day and there is some improvement in His Majesty's condition. (Signed by Sir Stanley Hewett and Lord Dawson of Penn.)

MONDAY, JAN. 7TH. 11.30 A.M.

The King has had a fair night and there is no change to report in His Majesty's condition.

7.45 P.M. The King has had a quiet day. There is no change to report in His Majesty's condition. The next bulletin will be issued to-morrow evening. (Signed by Sir Stanley Hewett and Lord Dawson of Penn.)

TUESDAY, JAN. 8TH. 8.15 P.M.

The King has had a quiet day. The condition of His Majesty remains unchanged. (Signed by Sir Stanley Hewett and Lord Dawson of Penn.)

BOSTON CITY HOSPITAL.—The sixty-fourth annual report of this institution, which, in addition to the main hospital, comprises a contagious diseases department, sanatorium, two relief stations, and a convalescent home, is exactly a year in arrear, the facts and statistics coming down only to Dec. 31st, 1927. The hospital, which is under the authority of the Boston City Council, spent £483,000, about £100,000 of which was recouped from ward and private room patients. In-patients cost 17*s*. 3*d*. per day, and the cost of out-patients was 2*s*. 11*d*. per visit. The report contains several illustrations of the new nurses' home, one of which shows the nurses' "sitting-room" as a stately pillared hall, its polished floor strewn with rugs. The nurses have a large swimming bath and a dining-room with separate tables, each seating four. Almost all the out-patient department clinics have been reorganised on an appointment basis, which is found to be well suited to the needs both of patients and doctors.

An Address

ON

MYOFIBROSITIS AS A SIMULATOR OF OTHER MALADIES.

Delivered before the Newcastle-on-Tyne and Northern Counties Medical Society

BY GEORGE R. MURRAY, M.D. CAMB., D.C.L. DURH., F.R.C.P. LOND.,

EMERITUS PROFESSOR OF MEDICINE IN THE VICTORIA UNIVERSITY OF MANCHESTER; CONSULTING PHYSICIAN TO THE ROYAL VICTORIA INFIRMARY, NEWCASTLE-ON-TYNE, AND TO THE MANCHESTER ROYAL INFIRMARY.

THE muscles make up about 40 per cent. of the weight of the body and actually weigh rather more than all the other organs together, including skin, fat, and blood. They are subject to all the stresses and strains of daily life, which vary greatly with the occupation followed. They are also apt to be affected, directly or indirectly, by the many changes in temperature and humidity which are characteristic of our British climate, in a manner we do not fully understand. Under these circumstances it is not surprising that the voluntary muscles are liable to suffer. Very little attention is paid by medical and surgical teachers to the varied symptoms which may be caused by diseases of the muscles compared with that devoted by the anatomist to their structure and distribution. Little space is devoted to this subject in the standard text-books of medicine. In one I pages out of 943 deal with the muscles. Ten ages are concerned with rare muscular diseases and nly one with fibrositis, the commonest of all. In nother text-book three pages out of 1711, and in nother two pages out of 1139 deal with fibrositis. Naturally students regard muscular diseases as of ttle importance and in after life are apt to ignore hem when searching for the cause of a pain. I hope o be able to show that this attitude of mind is apt o lead to unnecessary errors in diagnosis, and also o show how they may be avoided.

Myofibrositis has various names, such as myalgia, heumatic myositis, muscular rheumatism, or simply brositis, and this diversity of nomenclature is apt to ause confusion in the mind of the patient and loss of onfidence when he is told by one medical man that e has myalgia and by another that he suffers from brositis, so it is well to explain that these various erms really signify the same condition of inflammation f the fibrous portion of a muscle. This subject is of uch practical importance, as fibrositis, in the form f either myofibrositis or neurofibrositis, is one of the ommonest causes of pain in this country and is esponsible for a great deal of pain and disability. ir Walter Kinnear has shown what a loss to the nation s caused by the prevalence of industrial rheumatism, nd has estimated that in 1927 not less than 5,000,000 was paid under the National Health nsurance Scheme in Great Britain on account of heumatism, and that some £12,000,000 was lost in ages from the same cause. We may conclude that large proportion of this disability is really due to brositis. In addition to this fibrositis is apt to masquerade as a more serious malady and so give rise o much unnecessary anxiety if its true nature is not romptly recognised. Severe pain cannot be ignored, o medical advice is usually sought at an early stage. light and intermittent pain is often borne for long ithout complaint, though in time it is apt to give se to morbid fears. When relief is at last requested he prompt recognition of the fact that the pain is ue to fibrositis may save unnecessary worry in those ho have begun to dread that it indicates some serious rganic disease. The immense relief shown by an nxious sufferer when he is once convinced that his ain is due to a simple and removable cause and not to a progressive and incurable malady is remarkable. There is a grain of truth in the proverb "Fear kills more than disease," and, of course, another version, "Fear kills more than the physician" is certainly true. These are the cases in which the quack is apt to find his opportunity, as, trading on the fears of his client, he may employ some drastic form of local counter-irritation such as the application of the "life-awakener," followed by rubbing in croton oil, which may effectually remove the pain. He then claims to have cured the serious malady which only existed in the imagination of his credulous patient.

It is worth considering for a moment why it is that normally insensitive muscles may become the source of severe pain. The sensory nerves are connected with the muscle spindles which lie in the fibrous tissue which surrounds the muscular fibres. The tendons are also supplied with special sensory nerve-endings. In health we are not conscious of the impulses received from these structures. When, however, the muscles are strongly compressed, as in tetanus or in ordinary cramp, we at once become unpleasantly aware of their existence. In fibrositis these nerve-endings are irritated by the inflammatory exudate and there is a constant aching pain, which is aggravated by any contraction which compresses them and excites them still more.

DIFFERENTIAL DIAGNOSIS OF PRÆCORDIAL PAIN.

Pain which is felt in the præcordial region may be a source of anxiety to both patient and medical man; to the patient because he associates pain in this area with disease of the heart, and to the medical man because he realises that such a pain may be due to some form of angina pectoris. Fortunately, on investigation the pain often proves to be due to a local myofibrositis. It is important to be able to recognise this with certainty. I am not referring to pain in this area occurring in the course of an acute illness, such as pleurisy or pericarditis, which may be recognised by definite physical signs, but to pain in those who have no fever and are able to go about. Examination of the cardiovascular system reveals no abnormal physical signs, but this negative evidence does not eliminate the possibility of the pain being due to angina pectoris. In true angina the pain is intermittent and is brought on by exertion, emotion, or sudden chilling of the surface of the body. It tends to radiate across the chest and may extend into one or both arms or up the side of the neck—a distribution which may be simulated by fibrositis. The pain of fibrositis is induced or aggravated by use of the affected muscle, usually the pectoral or intercostal muscles, but not by other forms of exertion, such as walking uphill. It is unaffected by emotion. It is not accompanied by a sense of constriction or by the sudden fear of impending death which is so characteristic of some attacks of angina. Although rest eases both kinds of pain the well-known immediate relief afforded by the use of vasodilators in angina is not experienced when the pain is due to fibrositis.

Helpful as careful attention to these points may be, more positive evidence of the presence of fibrositis must be looked for. Careful palpation of the pectoral muscles in the relaxed condition with the arms hanging by the side may reveal the presence of a tender swelling near the lower border. The muscles should then be brought into action by asking the patient to press the palms of the hands firmly together with the arms extended in front of the chest. Firm pressure over the sternocostal insertions of the muscle will often elicit marked tenderness. On palpation of the rest of the muscle local swelling may be defined and its tenderness appreciated. The condition of the intercostal muscles may also be examined in the same area by making pressure over each space while deep breaths are drawn. The following two cases illustrate these points:—

A medical man brought his wife to see me because she was anxious about a pain situated at a point just above the left breast. This pain at times extended up the left side of the neck and was also felt in the left arm. She also suffered

from the hot flushes incidental to her age, which was 48. This lady had been in the habit of studying her husband's books and, as a result of her medical reading, she had come to the conclusion that she was suffering from angina pectoris. She had nervous tachycardia, but otherwise the cardio-vascular system was normal. On further inquiry it was found that the pain first came on after unusual efforts had been made with the arms and shoulders, was not induced by walking exercise, and was not paroxysmal in character. Examination showed that there was fibrositis of the left pectoral muscle at the point where the pain started and also at its sternal attachment. There was also fibrositis of portions of the left sternomastoid and deltoid muscles which accounted for the extension of the pain to the neck and arm. It is easy to understand how a woman at the climacteric, when morbid fears of disease are common, with a little medical knowledge, which is proverbially dangerous, became convinced she was suffering from angina pectoris. It is not unlikely that some of the cases which have been described as false or vasomotor angina have been due to fibrositis.

Another case was that of a man aged 28, a "tackler," who had suffered intermittently for four years from a pain in the left side of the chest. Shortly before the pain was first felt the muscles of his shoulder, arm, and chest had been subjected for a time to unusual strain. Since then he had been liable to severe attacks of pain commencing at a point just above the left nipple. He was free from pain on waking, but any exertion after rising, such as stooping to lace his shoes, might bring it on. On some days the pain did not come on until the afternoon, but it occurred at some time or other every working day. The pain at times had extended round to the axilla or up the left side of the neck as far as the ear, and at one time it used to reach the middle of the upper arm. Occasionally he had palpitation, and he had been told that he had strained his heart. Such a history and the position and distribution of the pain suggested that it was due to angina pectoris. Examination of the circulatory system revealed no abnormality. The age and occupation of the patient, and the incidence of the pain after work with the arms but not after walking, all indicated that the voluntary muscles and not the heart were at fault. On careful palpation a tender swelling was found near the lower border of the pectoralis at the point where the pain usually started. This swelling was felt most distinctly when the arm was held up above the head.

Fibrositis of the pectoral muscles appears to be more common on the left side than on the right. This is remarkable, as the right arm is used more than the left. Possibly this difference is more apparent than real, because a pain which is felt on the left side in the præcordial region is more likely to give rise to alarm and a desire for advice and treatment than a pain on the right side.

Quite recently, however, I have seen a case in which fibrositis of the right pectoral muscle had caused in the mind of the patient grave fears that he was suffering from cancer of the right lung. His own medical man, even when a radiogram of the chest had shown a normal appearance, had not convinced him that his fears were groundless, and so he sent him to me to endeavour to disabuse him of this obsession, which had originated after the death of a friend from malignant disease of the lung.

The Importance of Rest in Treatment.

While considering fibrositis in this region we may recall the principles laid down by Hilton in his well-known "Lectures on Rest and Pain," and emphasise the importance of securing adequate rest and relaxation of these muscles in the treatment of this condition. Dr. R. T. Williamson has drawn attention to the importance of support and fixation of the arm in the treatment of brachial neuritis, which is a common form of neurofibrositis. He pointed out that treatment often failed to relieve pain until the arm was fixed in a sling which supported it and raised the elbow sufficiently to elevate the clavicle and prevent the weight of the arm from dragging on the shoulder and nerves. The value of this I can confirm, and may add that the same kind of support is just as important in the treatment of fibrositis of the pectoral and other muscles concerned in the movements of the shoulder. An ordinary sling may be used, provided it is properly applied, though the double objects of fixation and elevation, so as to take the weight of the arm off the shoulder, are attained better by the use of the "Euphorus" sling, which may be worn by night as well as by day until the pain has disappeared. It may be mentioned, in passing, that this form of support is useful in the treatment of that obstinate form of myofibrositis which develops in the uppermost portion of the trapezius muscle with a well-defined local swelling in that area.

Other Conditions Simulated by Fibrositis.

Pleurisy may be simulated by fibrositis of the intercostal and other respiratory muscles, as the pain is felt in the side of the chest; it is severe and is aggravated by respiratory movements and there may be a slight temporary rise in temperature. In pleurodynia, however, there is no persistent fever, the physical signs of pleurisy are absent, and a localised area of tenderness can usually be detected in the region where the pain is felt.

Diseases of the blood-vessels may also be simulated by fibrositis. Intermittent claudication, in which, after a short walk, pain in the leg stops further progress until a brief rest has been taken, is due to inadequate supply of blood to the muscles resulting from narrowing of the lumen of the artery. In the following case the description of the symptoms as given by the patient was strongly suggestive of this condition.

A clergyman, aged 60, complained of pain in the leg at the back of the knee, which came on after he had walked a short distance and passed off when he rested. He had, in fact, an intermittent limp similar in character to the special form just mentioned. There was, however, no change in the colour of the skin and there was no sign of arterial disease. On examination the pain was found to be due to fibrositis of the hamstring tendons and was probably gouty in origin. A suitable diet was recommended, colchicum and potassium citrate were prescribed, and peat packs were applied at Buxton. He rapidly recovered and soon was able to walk about in comfort.

Occasionally a strip of the soleus muscle is inflamed and simulates phlebitis, but careful palpation shows that the tender cord-like swelling is in the muscle and not in a vein. Lumbago we all know, some of us more intimately than we like, but I do not propose to discuss the various causes of backache and how they may be distinguished from lumbago, as that is a familiar theme.

Fibrositis of the Abdominal Muscles.

Lumbago is more common in men than in women, who are more liable to fibrositis of the muscles of the anterior abdominal wall. This form often gives rise to fears of intra-abdominal disease. When you have determined that the pain is due to myofibrositis it eases the patient's mind to explain that the condition is of exactly the same character as lumbago but involves the muscles in front of the body instead of those of the back. Of all the muscles in the anterior abdominal wall the recti are the most liable to fibrositis. The pain which this causes is apt to be attributed to some serious intra-abdominal condition; it was described as "peritonitis muscularis," by J. P. Frank in 1792. In spite of the name, he evidently recognised that it affected the abdominal wall alone and not the peritoneum. The presence of three tendinous insertions in addition to the terminal attachment of the muscle explains its liability to inflammation. Pain in the right iliac region suggests appendicitis.

A man who was actively engaged in business and also hunted regularly complained of an aching pain of several weeks' duration in the right iliac region. He had come to the conclusion that he was suffering from appendicitis. There were no other symptoms. When the abdomen was examined with the muscles fully relaxed no superficial or deep tenderness or swelling could be detected. When the recti were brought into action by raising the trunk half-way between the supine and sitting positions an area of tenderness was at once found in the outer border of the right rectus just where the pain was felt. The application of iodine and belladonna ointment was soon followed by disappearance of the symptoms.

I have described elsewhere a similar case in which the pain came on after punting, soon after the patient's

ister had suffered from an attack of acute appendi-itis, so that suggestion had no doubt helped to arouse he fear of appendicitis.

Fibrositis of the upper segment of the left rectus or of its fibrous insertion into the fifth, sixth, and seventh ribs may simulate gastric disease, as it is iable to be increased after a meal if the stomach becomes distended. Otherwise it bears no relation-hip to digestion, is relieved by rest in the supine position, and is aggravated by any effort which exercises or strains the abdominal muscles. Often an actual swelling can be detected in the muscle, or at any rate an area of pain and tenderness is found when the muscle is brought into action. I have recorded a case in which pain in the right hypo-chondrium had been attributed for four years to biliary colic, but on investigation proved to be due to fibrositis of the outer part of the right rectus. A continued pain in the lower part of the abdomen may give rise to a dread of malignant disease.

The chief characteristics of fibrositis of the abdominal muscles are these. The pain is of a dull aching character, generally felt at one particular spot, from which it tends to radiate. It is relieved or removed by rest in bed at night. It comes on again soon after rising and increases in severity and in area during the day. There is no cutaneous hyperæsthesia. Certain movements may be acutely painful, especially if executed after resting in one position. For exam-nation, the patient should first of all lie flat on the back with the knees drawn up, so as to relax the muscles. On palpation a definite, slightly tender swelling may be felt in the muscles at the seat of the pain. The recti muscles should then be contracted strongly by raising the head and upper part of the trunk from the recumbent position. Firm pressure should be made with the tips of the fingers on the muscle at the point where the pain is felt, and it will be found to be acutely tender. This is the important point: the tenderness under the same pressure is far greater when the muscle is contracted than when it is relaxed. This is just the opposite to what is found when tenderness is due to some intra-abdominal disease, as the contracted muscle then acts as a defence and the tenderness is less than when pressure is made with a relaxed abdominal wall, and cutaneous hyperæsthesia is usually present. In the contracted muscle some fullness, or even a definite swelling, may be felt at the site of the fibrositis.

Headache.

The subject of headache is an important one and the determination of the cause may be difficult. Broadly speaking, headache may be due to local disease either inside, outside, or in the bones of the skull, or to changes in the nerves or the blood-vessels of the head, to abnormalities of the eye or ear, or to general toxic states resulting from maladies of the alimentary canal, kidney, or other organs; or, again, the headache may be of the paroxysmal type known as migraine. In searching for the cause of a headache it should be remembered that one cause, by no means rare, is fibrositis of the occipito-frontalis muscle and of the epicranial aponeurosis. This type of headache is sometimes called "rheumatic." In arriving at the conclusion that pain in the head is due to fibrositis the other forms of headache must be excluded by a full examination, which in these cases reveals no signs of any other malady. A fibrositic headache may simulate a cranial neuralgia, though it is generally more constant. It may be felt chiefly in the region of the occipital or frontal muscle or it may be diffused all over the region covered by the epicranial aponeurosis. Voluntary movements of the scalp are often painful, and on careful palpation small tender swellings may be detected in or at the line of attachment of the occipital or frontal muscular fibres to bone or fascia. In some cases there is a diffuse tenderness all over the scalp. The pain may be affected by changes in the weather and by exposure to cold. In men, at any rate, liability to this form of headache has not appeared to be related in any way to the amount of hair on the head. The previous or simultaneous occurrence of fibrositis of the muscles of the neck or trunk may serve as a guide to the recognition of the true nature of the headache.

An example of this type of headache is furnished by the case of a woman of 63 who complained of headache of a year's duration. None of the usual causes of headache appeared to account for it. The pain shifted from one part of the head to another and at times extended all over the top of it. It was worse when she was tired. There was a dry arthritis of both knees and an early cataract of one eye This headache was found to be due to fibrositis of the scalp.

Neuritis, which is usually a neurofibrositis, is a common cause of pain and is not infrequently asso-ciated with myofibrositis. When it occurs as an independent affection it is less liable than myo-fibrositis to cause morbid fears, because it occurs so much more frequently in the limbs than in the trunk. It is, moreover, well known that a pain referred to a particular nerve may be due to irritation or pressure at some point along the course of the nerve and not to fibrositis. Thus, in a persistent brachialgia, a search for an accessory rib is usually made with the aid of X rays; in sciatica this factor is borne in mind and a careful search is made for disease of the spine or pelvic organs. How elusive such a source of the pain may be was well illustrated by a case in which a man had a severe chronic sciatica with marked wasting of the muscles. We searched thoroughly for a local cause but failed to find one, and this was before X rays had come into general use. Later on a swelling developed in the gluteal region. On exploration this proved to be due to a hydatid cyst in the sheath of the sciatic nerve. The pain of persistent myofibrositis, like that of neuritis, is very exhausting, and its effect may be felt for some time after it has ceased. This after-effect may be experienced either when the pain is only of moderate severity but long duration, or when it is of shorter duration but greater intensity. The feeling of exhaustion is very depressing and helps to suggest all kinds of gloomy forebodings as to the source of the pain and the final outcome of the illness.

The points which may be specially emphasised are: (1) Myofibrositis is a very frequent malady not only in well-known situations, such as the lumbar muscles, but in many other muscles of whose existence we are hardly aware in health. (2) Myofibrositis must always be considered as a possible cause of an obscure pain. (3) As fibrositis is apt to cause much unnecessary anxiety, its prompt recognition is most important for the relief of the patient's mind. (4) Though not a fatal malady it causes much distress and disability and is worthy of much more attention and research than it has received hitherto.

Prevention and Cure.

We know so little about the cause of fibrositis that it is difficult to say what precautions can be taken to prevent it. Many cases date from a sudden or prolonged strain of the affected muscle to which little attention was paid at the time. This indicates that rest of an overstrained muscle until all pain has disappeared would in many cases obviate a subsequent and probably prolonged attack of fibrositis. This rest is even more important if there is any indication that some of the muscular fibres have been ruptured by a sudden strain. Those who have once suffered from fibrositis are liable to have recurrences unless they are able to determine the exciting cause in their particular case and to avoid it in the future. Any form of severe exercise which has not been undertaken for some time, such as that entailed by gardening, rowing, or salmon-fishing, and which leaves only stiffness in many men, may induce a sharp attack in those who are liable to fibrositis. This may be pre-vented by taking the exercise in gradually increasing amount at the beginning of a holiday—unfortunately a counsel of perfection for those who can only take an occasional day off from an otherwise sedentary

existence for the special form of exercise they prefer. Any chilling after exercise in damp clothes may bring on an attack, but this can usually be avoided by a little forethought. If exposure to any of these conditions is unavoidable, the ill-effects may often be warded off by a hot bath, drinks of some hot fluid to which the addition of alcohol is by no means necessary, and rest in bed. Prof. Stockman considers that fibrositis is usually the result of a secondary infection, and Rosenow has shown that myofibrositis may be caused by streptococci of low virulence lodged in the capillaries near the tendinous insertions of the affected muscles. It is therefore important to search for a septic focus in the mouth, nose, throat or elsewhere which, by causing secondary infection, subinfection, or toxæmia, may be the primary cause of the condition. If such a source is found it must be treated at once. A friend and colleague used to suffer greatly from lumbago until it was discovered that he had a marked focus of dental sepsis. As soon as this had been removed the lumbago disappeared and has not recurred. In many cases no septic focus can be found, so that other causes must play their part. A sudden onset without fever suggests the rapid deposition of some chemical irritant such as occurs in gout, and it is probable that some forms are really gouty in origin. It is important to avoid all excess of either red meat or sweets unless plenty of outdoor exercise is being taken. Certain wines, such as claret, may predispose to an attack.

At the onset of an acute attack a vapour bath at 120° F. for 15 minutes, or a hot bath with the water as hot as it comfortably can be borne, followed by rest in bed, will give much relief. At the same time grs. 5 each of aspirin and Dover's powder may be given and repeated several times at intervals of four hours. The application of a belladonna fomentation over the affected muscle will also help to ease the pain. Other useful local applications, such as a liniment composed of equal parts of camphor, menthol, and chloral hydrate, or one of the liniments or ointments containing menthol and methyl salicylate, are well known and efficient in both acute and chronic forms of the malady. In gouty cases colchicum and alkalies are of service. In subacute and chronic cases iodine is useful internally, and iodine and belladonna ointment is a valuable local application. Five grains each of guaiacum and sulphur thrice daily after food may be given in milk or in a cachet. Tincture of cimicifuga, which should be prescribed with a few minims of liquor potassiæ to prevent precipitation, is often beneficial. In prolonged or recurrent cases a course of treatment at Buxton, Harrogate, or Bath is strongly to be recommended. There is a great field of useful work for clinics specially equipped for the treatment of rheumatism, like that organised by the British Red Cross Society in London, where the benefits of hydrology and physical treatment will be available for those who could not otherwise obtain them.

Each of the forms of fibrositis mentioned may require adaptation of these general modes of treatment to suit the special requirements of the case, as, for example, in securing adequate rest for the affected muscle. In the treatment of abdominal fibrositis rest in bed is most important, but many patients prefer to put up with the pain rather than to submit to this treatment as soon as they realise that there is no internal lesion, such as a gastric ulcer. It happens occasionally that one of these cases is admitted to a hospital ward, and then the good effect of rest in bed is striking when compared with the slow progress made when treatment is carried on while the patient is up and about. The sacrifice of a little time for adequate rest in bed would be well worth while in many cases where this precaution is neglected and a chronic fibrositis becomes established. In the treatment of fibrositis of the scalp the local application of one of the remedies already mentioned may do much to relieve this form of headache.

SEGMENTAL HYPERALGESIA ASSOCIATED WITH HÆMOPTYSIS.

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During an investigation, extending over four years, of pain and its attendant phenomena in pulmonary disease, I have observed that segmental or referred cutaneous hyperalgesia in most of my cases has been associated with recent hæmoptysis. Some of them have exhibited other reflex signs such as muscular tenderness over one side of the chest, localised tonic spasm and tenderness or, in the later stages, localised wasting of certain groups of muscles such as the trapezius, pectorals, and scalenes. When acute and subacute pleurisy has been present direct cutaneous hyperalgesia and deep tenderness respectively were found, a fact to which I referred in a previous communication.[1] Some cases presented complex signs very difficult to interpret, but in others the phenomena were so clear-cut and constant that I have thought it worth while to report examples, and to confine my remarks mainly to the association of segmental hyperalgesia with hæmoptysis.

These examples are taken from a series of over 300 cases, of which 180 gave a history of hæmoptysis. Segmental hyperalgesia was present in 42 of them. In general, the areas of hyperalgesia were discovered after the onset of the hæmoptysis and persisted for about 14 days. Sometimes the patient said that the skin had been tender for several days before the hæmorrhage. When a further hæmoptysis occurred, the hyperalgesic areas reappeared in the same position and lasted again for 14 days. The hyperalgesia was assumed to be segmental if two areas were found, one on the anterior aspect of the chest and the other posteriorly (see Figs. 1, 2, and 4), and both corresponding to part of the cutaneous distribution of the same spinal segment or segments. Each hyperalgesic area was roughly circular in shape, with a sharply defined border, about 2 inches in diameter, and they were found generally either near the apex or near the base of the chest. The apical areas (see Figs. 1 and 4) were situated close to the mid-line near the sternum in front, and near the spinal column posteriorly, but both being either to the right or left of the mid-line. The basal areas (see Fig. 2), both anterior and posterior, were found about 2 to 3 inches from the mid-line. Where a pulmonary lesion was discovered, the hyperalgesic areas were invariably on the same side as the lesion. Generally the areas were found to persist for 14 days after the hæmoptysis, and each area gradually diminished in size. It was noticed that the anterior area persisted for several days longer than the posterior. The following cases are cited as good examples of the condition.

Illustrative Cases.

Case 1. *Inextensive, inactive pulmonary tuberculosis in the right upper lobe.*—A married woman, aged 27, was seen first on April 30th, 1926, when she complained of a cough accompanied by small hæmoptyses for three days, scanty expectoration, and dull pains in the front and back of the chest. There were no night sweats, no dyspnœa, and no loss of weight. Inquiry into the family history revealed nothing relevant. The only previous illness which she could remember was a severe cough five years ago, which lasted for two months. Since then she had been entirely free from symptoms until the time of examination.

She was a moderately well-nourished woman and the weight was 8 st. 3 lb. The temperature was 98·4° F., pulse-rate 80, and respiration-rate 24. Slight cyanosis of the finger-nails with central pale areas was observed. All systems except the pulmonary were found to be normal.

The chest on inspection showed slight flattening and diminution of movement at the right apex. Palpation confirmed the diminution of movement. No appreciable alteration was detected in the vocal fremitus. The percussion note was of slightly higher pitch—i.e., impaired—at the right apex, both anteriorly and posteriorly. On

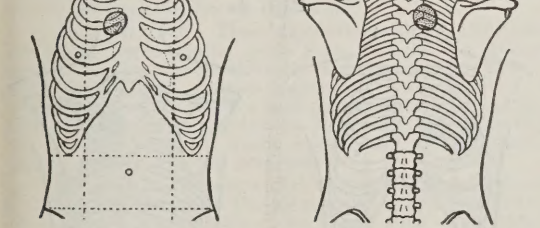
auscultation the breath sounds were heard to be somewhat distant and the expiration a little more prolonged than normal at the right apex. No adventitious sounds were heard. Two *hyperalgesic areas*, one in front and the other posteriorly, were found, each 1½ inches in diameter (Fig. 1). The anterior area was situated over the third interspace close to the sternum, but to the right of the mid-line, and the area at the back was over the fourth rib (or opposite the fourth and fifth dorsal vertebræ), immediately to the right of the spinal column. These areas correspond to part of the cutaneous distribution of the third and fourth dorsal segments of the cord.

No tubercle bacilli were found in the sputum. A radiogram taken on April 30th (the day of the first examination) showed some calcified nodes near the right hilum and a few small opacities in the centre of the right upper lobe.

Three days later the areas of hyperalgesia were still present, and were unaltered in size or position. No further hæmoptysis had occurred. Ten days after the first attendance a small area of hyperalgesia was present in front, but the area at the back had disappeared. Seventeen days after the first attendance she felt very well. She had no cough, only slight expectoration, and no pains in the chest. No areas of hyperalgesia were found.

This case showed segmental hyperalgesia involving the peripheral cutaneous distribution of the third and fourth dorsal segments in inextensive and probably inactive pulmonary tuberculosis of the right upper lobe. The hyperalgesia was situated on the same side of the lesion and lasted for about 14 days after the onset of the hæmoptysis. The calcified nodes near the right hilum with the history of a severe cough five years previously indicate probably that she then had a mild tuberculous lesion about the right hilum which healed by calcification. The hæmoptysis might have been due to the calcified nodes acting as foreign bodies and irritating the bronchial mucous membrane, or alternatively to a fresh and limited extension of the disease of low-grade activity into the right upper lobe. The subsequent history has shown that the lesion is still quiescent and has probably healed without active treatment. In the absence of tubercle bacilli from the sputum, no absolute proof existed, of course, that the pulmonary lesion was tuberculous, but the definite

FIG. 1.



Areas of cutaneous hyperalgesia in Case 1.

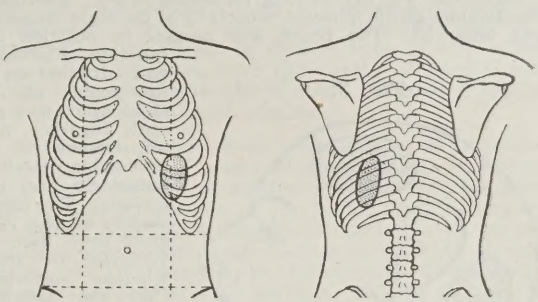
physical and radiological signs taken in conjunction with the segmental hyperalgesia were strongly suggestive that the bleeding originated in a focus in the right lung.

CASE 2. *Simple basal fibrosis with bronchial dilatation.*—A married woman, aged 30, attended St. Thomas's Hospital on April 30th, 1926, and complained of having coughed up a little blood seven days previously, and of pains in the back and front of the left base of the chest. She also complained of having had a cough for one month, with expectoration, some shortness of breath, and slight loss of weight. Her only previous illnesses were a winter cough (bronchitis) for eight years, and measles at 10 years of age. She had had five uneventful confinements. Nothing of note could be gleaned from the family history.

She looked pale and a little wasted. The temperature was 98° F., pulse-rate 76, and the respiration-rate 24. She weighed 8 st. 12 lb. The fingers were not clubbed.

The heart was found displaced 1 inch to the left. The heart sounds, however, were normal and regular, with the exception that the pulmonary second sound was slightly accentuated. The movement of the left side of the chest was diminished, especially at the base, and the percussion note was impaired over the left lung field, but more markedly at the base. On auscultation bronchial breathing was heard at the left base with a few medium crepitations, both inspiratory and expiratory. The vocal resonance and the whispered sounds were accentuated in the same region. Two areas of cutaneous hyperalgesia about 3 inches in diameter were observed, one in front situated over the fifth, sixth, and seventh ribs, and the other posteriorly opposite the eighth, ninth, and tenth dorsal spines (Fig. 2), both areas corresponding to part of the cutaneous distribution of the fifth, sixth, and seventh dorsal segments.

FIG. 2.



Areas of cutaneous hyperalgesia in Case 2.

Each area was 2½ inches from the mid-line of the body. The sputum did not contain tubercle bacilli. A radiogram of the chest showed the heart displaced to the left, and a fairly dense opacity at the left base, confirming the clinical diagnosis of left basal fibrosis.

The patient was seen again on May 3rd (three days later), when the hyperalgesic areas were found to be still present in the same positions, but were a little smaller in extent. She attended again on May 10th, one week later, when she said that she felt much better and that the pain in the back had gone. No further hæmoptysis had occurred. The anterior hyperalgesic area was still present, but was only ½ inch in diameter. The posterior area had disappeared. On May 17th she was seen again, when she said that she had no pains in the chest, no cough, and only a little sputum. No areas of hyperalgesia could be found. The physical signs of left basal fibrosis were still present.

An interesting feature in this case was that the bleeding took place from a cavity due to bronchial dilatation. Head [2] pointed out that in the excavation type of phthisis segmental hyperalgesia did not occur because in all probability in the destruction and excavation of pulmonary tissue the nerve-endings are also destroyed. Consequently, the primary component of the reflex arc is abolished, and afferent impulses can no longer pass to the spinal cord. In my series none of the cases in which the bleeding arose from a tuberculous cavity developed segmental hyperalgesia. But when, as in the above case, the source of the hæmorrhage was in a bronchiectatic cavity or bronchial dilatation, the occurrence of segmental hyperalgesia was fairly common. The explanation appears to be simple. A bronchiectatic cavity is caused by dilatation of a bronchus with no loss of pulmonary tissue, and the nerve-endings remain intact, allowing afferent impulses to pass to the spinal cord and set up cutaneous hyperalgesia.

The position of each hyperalgesic area in this case was 2½ inches from the mid-line, and in the situation of part of the cutaneous distribution of the fifth sixth, and seventh dorsal segments. These features were constantly observed in the other cases where the bleeding took place from bronchial dilatations in the lower lobe of the lung.

CASE 3. *Fibroid tuberculosis involving the extreme apex of the right lung, and also the apical pleura.*—A valet, aged 41, attended St. Thomas's Hospital first on March 10th, 1927, complaining of hæmoptysis which had commenced 28 days previously and had continued for 14 days—i.e., the bleeding ceased 14 days before the patient was first seen. He also

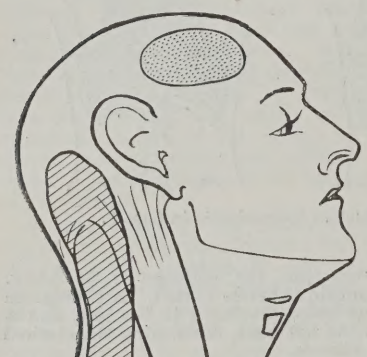
complained of pain and tenderness of the right side of the scalp and neck, commencing with the onset of the hæmoptysis. The pain and tenderness had persisted since, with a subsequent diminution of the scalp pain and tenderness, while that involving the side of the neck had increased. Other symptoms included cough, which he had had for one year, slight expectoration, night sweats, shortness of breath, palpitation, and some loss of weight.

His father and grandmother had both died from pulmonary tuberculosis. At 14 he had an attack of rheumatic fever. In 1921 and 1923 he had attacks of "pleurisy and pneumonia."

His general condition was moderately good, although it was obvious that he had lost a little weight. The temperature was 98·2° F., the pulse-rate 80, and the respiration-rate 26. The weight was 9 st. 11 lb.

The chest was of the long phthinoid type. Wasting of the shoulder girdle muscles, especially of the right trapezius, was observed. The heart was normal in position and function. Flattening and diminution of movement at the right apex was present, together with impairment of the percussion note both anteriorly and posteriorly. The breath sounds at the right apex were bronchovesicular in front, whereas posteriorly they were definitely bronchial* in character. The vocal resonance was increased over this area. A few consonating crepitations were heard at the right apex posteriorly. Over the rest of the lungs the physical signs were normal. An area of cutaneous hyperalgesia was present on the right side of the neck (as shown in the diagram (Fig. 3)), involving part of the skin distribution of the third and fourth cervical segments. The patient stated that at the onset of the hæmoptysis the right side of the forehead and top of the scalp was distinctly tender, but that this tenderness had disappeared at the time of the examination. The sputum examination failed to reveal tubercle bacilli, but X ray examination showed that a small area of old tuberculous disease involved the extreme right apex. No cavitation was visible.

FIG. 3.



The stippled area on the scalp represents the position and comparative extent of hyperalgesia said by the patient to be present at the onset of hæmoptysis. The lower area (shaded) shows the position of the cutaneous hyperalgesia found on examination.

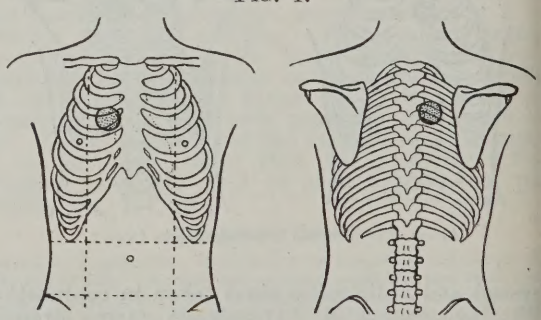
As the patient did not attend again, owing to his having left London shortly after the first attendance, I was unable to trace the subsequent progress.

There is very little doubt that the cause of the hæmoptysis was a fibroid patch of pulmonary tuberculosis at the extreme right apex involving the apical pleura, and that the hyperalgesia of the scalp and neck was associated with the onset of the hæmorrhage. This is the only case of pulmonary disease in which I have found hyperalgesia of the scalp and neck, apart from involvement of the third and fourth cervical areas in cases of diaphragmatic pleurisy. Head [2] and Carmalt-Jones [3] record cases of pulmonary disease in which referred hyperalgesia has affected the cervical segments of the cord, and Head emphasises the frequency with which hyperalgesia of the scalp and shoulder occurs in association with disease of the upper lobes of the lungs. He maintains that the afferent impulses pass by means of the vagus and are referred to the area of cutaneous distribution of the fifth cranial nerve and to the third and fourth cervical segments. It is difficult to understand why affections of the upper lobes only should set up vagal irritation. The vagus, as far as anatomical and physiological evidence shows, is supplied to the whole of the pulmonary parenchyma, and not only to the upper lobes, and on Head's hypothesis it would be expected that irritative affections in all parts of the lung would set up vagal irritation and hyperalgesia of the scalp. A more plausible explanation seems to be that in affections of the upper lobe the phrenic nerve is affected on account of its close anatomical relationship with the apex and the medial surface of the upper lobe and the afferent impulses setting up referred hyperalgesia in the areas of C. 3 and 4 are conveyed by that nerve. It is difficult to explain the connexion between the phrenic and the trigeminal nerves, but the recent work of Stopford [4 5] on the relationship between the accessory phrenic and the nucleus of the trigeminal especially the ophthalmic division, appears to offer a reasonable explanation. An attractive hypothesis would be that hyperalgesia of the scalp is only found associated with chest affections in those instances where an accessory phrenic nerve is present. The relative frequencies at least of the two conditions coincide—i.e., they are both rare.

CASE 4. *Recurrent hæmoptysis associated with recurrent segmental hyperalgesia in fibroid tuberculosis of the right upper lobe.*—This patient has been under continuous observation since, as a girl of 20, she first attended the Tuberculosis Department at St. Thomas's Hospital on March 14th, 1923, giving a history of having coughed up a pint of blood three weeks previously, with a second smaller amount one week later. She also complained of morning cough and sputum, pains in the chest, night sweats, shortness of breath, and loss of weight. Four years previously she had tuberculosis of the left knee, which was treated by immobilisation at the Westminster Hospital. Her father had died of pulmonary tuberculosis six years previously.

No definite physical or radiological signs were found, and she was sent for observation to Victoria Park Hospital, to which she was admitted under Dr. Clive Riviere, and where as resident medical officer, I had an opportunity of observing her. During her stay at the hospital from Jan. 11th to Sept. 7th, 1924 (a period of about eight months) she had a cough, expectoration, recurrent attacks of hæmoptysis, and a variable intermittent fever, rising to 100° F. in the evening. The physical signs in the chest were indefinite with the exception that the percussion note was slightly impaired over the right upper lobe, and the breath sounds over this area were distant. No crepitations were heard. The sputum was negative for tubercle bacilli on more than 30 occasions, but on one occasion a few bacilli were found. This was thought possibly to have been an error. The complement-fixation reaction for tuberculosis was negative and numerous radiographic examinations failed to reveal any definite abnormality in the chest. All the other systems were investigated for a possible cause of the pyrexia without a positive result. For example, blood cultures were persistently sterile, the blood counts normal, and urinary examinations and cultures were negative. The nervous system was normal.

FIG. 4.



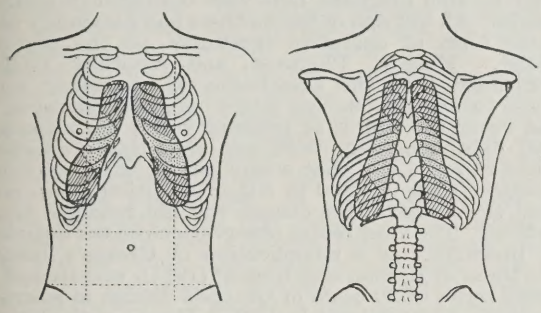
Areas of cutaneous hyperalgesia in Case 4.

* The fact that the breath sounds were bronchial in type does not necessarily mean that cavitation was present. The physical signs of cavitation differ very little from those of consolidation or thickening round a bronchus. In any case bronchial breath sounds are heard in both conditions.

During the whole of this period the patient complained of vague pains in the right side of the chest, which became worse when she had an hæmoptysis. On examination, two areas of cutaneous hyperalgesia were present, one anteriorly near the sternum, and the other posteriorly near the spinal column involving part of the areas supplied by the third and fourth dorsal segments (Fig. 4). These areas gradually became less in extent until about 14 days after the attack of hæmoptysis they disappeared, to reappear when a fresh attack of hæmoptysis occurred. The position of the hyperalgesia was constant on each occasion.

After discharge from Victoria Park Hospital she has attended the Tuberculosis Department at St. Thomas's

FIG. 5.



Areas in which segmental hyperalgesia on the chest wall was found in the present series of cases. The darker areas represent the more common situations (apical and basal).

Hospital, and I have had her under observation up to the present time. She has had many attacks of hæmoptysis at varying intervals, not obviously associated with menstruation, sometimes slight and sometimes so severe as to necessitate her admission to hospital. On each occasion the areas of hyperalgesia have been present involving the third and fourth dorsal segments. Although the patient has many times complained of headache, no hyperalgesia of the scalp or of the cutaneous distribution of the third and fourth cervical segments has been found. Radiographs and physical examination now shows a definite fibroid lesion in the right upper lobe below the apex with traction on the trachea, *but no sign of cavitation.* Tubercle bacilli are now present in the sputum. She frequently complains of dull aching pains in the right side of the chest and in the right shoulder, not made worse by coughing or breathing, but in the intervals between the attacks of hæmoptysis no areas of hyperalgesia are found. The following notes of examinations on four occasions illustrate this point.

(1) May 7th, 1926 : Three days after a slight hæmoptysis. Cutaneous hyperalgesia, each area 2 inches in diameter, present on the right anteriorly and posteriorly, involving third and fourth dorsal segments. Complains of dull aching pains in the right upper part of the chest and in the right shoulder, not aggravated by coughing or breathing. The muscles over the right upper half of the chest are slightly tender on deep pressure.

(2) June 4th : Five days after an hæmoptysis. Cutaneous hyperalgesia present in the same areas ($\frac{1}{2}$ inch in diameter). Complains of similar pain. An X ray film of the chest at this time shows some fine mottling and fibrosis below the right apex.

(3) Nov. 26th : Four days after an hæmoptysis ($\frac{1}{2}$ pint). Cutaneous hyperalgesia present in the same areas. Pain of similar nature still present.

(4) Dec. 12th : No further hæmoptysis. Still complains of pain, although less intense. Cutaneous hyperalgesia not present.

For many months, apart from the recurrent hæmoptysis, no definite clinical, bacteriological, or radiological evidence existed which proved the presence of a tuberculous focus in the lung. In the light of further observation and further experience of similar cases, the constant appearance of segmental hyperalgesia on the right side involving the third and fourth dorsal segments was an early sign pointing to the presence of an inflammatory lesion without cavitation in the right apex.

The disease is of a slowly progressive, fibrotic type, the general condition of the patient having altered very little in the past five years. The lesion in the lung has now been demonstrated clinically by the physical signs, bacteriologically by the presence of tubercle bacilli in the sputum, and radiologically by the presence of mottling in the right upper lobe and by evidence of traction on the upper mediastinum.

Hæmoptysis from a Tuberculous Cavity.—In all cases where the bleeding undoubtedly originated in a tuberculous pulmonary cavity no areas of segmental hyperalgesia were observed. The findings, therefore, coincided with Head's theory of destruction of the nerve-endings and of the consequent obliteration of the first component of the reflex arc. In a few cases, however, a single localised patch of cutaneous hyperalgesia, and sometimes with deep tenderness, was found on the anterior aspect of the chest wall directly over the cavity, and not necessarily associated with hæmoptysis. This single, localised area is an example of the direct or pleural type of hyperalgesia due to the presence over the cavity of pleural adhesions setting up a localised acute or subacute inflammation of the parietal pleura.

Congestive Hæmoptysis.—No areas of segmental hyperalgesia were found in those cases in which it could reasonably be assumed that the hæmoptysis was due to congestion of the lungs, such as in mitral stenosis † and other cardiac conditions ; in pressure on the bases of the lungs as, for example, in the later stage of pregnancy ; in pulmonary neoplasm, in chronic bronchitis and asthma, and in chronic pulmonary tuberculosis in which, according to Hebert,[6] localised congestion may occur owing to pressure on the pulmonary veins and venules by the contraction of fibrous tissue.

Discussion.

The study of this series of cases, of which the above are examples, has raised many interesting problems, such as the interpretation of the varied reflex phenomena and their paths of transmission, the innervation of the lungs and pleura, and the subjective phenomena of pulmonary disease, but it is not possible in the scope of this paper to enter into a full discussion of them. It may be stated, however, in regard to the presence of segmental hyperalgesia in association with recent hæmoptysis and in the absence of other definite clinical, radiological, and bacteriological evidence, that it may be considered an early sign of a non-excavated inflammatory lesion in the lung. Its connexion with hæmoptysis is, I think, accounted for by the fact that the latter is a very common sign of inflammatory changes in the lungs. Further, it may be stated that the situation of the hyperalgesia definitely indicates the side and site of the lesion. Apical lesions are connected with the third and fourth and occasionally the fifth dorsal segments of the spinal cord, whereas basal lesions are associated with the fifth, sixth, and seventh, and occasionally the eighth dorsal segments. The hyperalgesic areas are invariably situated, both anteriorly and posteriorly, close to the mid-line of the body, but those due to basal lesions are placed about $2\frac{1}{2}$ inches more laterally than the apical areas (Fig. 5).

The association of hæmoptysis and segmental hyperalgesia, as far as I have been able to determine from a study of the literature, has not been previously described.

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4. Stopford, J. S. B. : Jour. Anat., 1924–25, lix., 120.
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† I have noticed the presence of segmental hyperalgesia in a number of cases of mitral disease, not associated with hæmoptysis, but with acute or subacute endocarditis. In these cases the hyperalgesic areas are situated on the left side close to the mid-line of the body, but midway between the apical and basal sites found in pulmonary disease.

PREGNANCY COMPLICATING SIMPLE GOITRE AND GRAVES'S DISEASE.

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THE problems to be discussed in this paper are those of the incidence, results, and effects of pregnancy in simple goitre and Graves's disease. The data have been obtained from a study of the histories of 115 married women suffering from these conditions. Twenty-six were cases of simple goitre and 89 of Graves's disease. Of the latter, 71 may be classified as primary Graves's disease—i.e., patients presenting the classical picture, with diffusely enlarged vascular goitres, eye signs, tremor, tachycardia, and nervousness, in whom symptoms of intoxication had been present from the outset. The remaining 18 were cases of secondary Graves's disease in whom symptoms of intoxication had appeared after some years during which a simple goitre had been present. In these patients the eye signs were usually less prominent and the goitre smaller, harder, and more irregular than in the primary form.

Historical Review.

In the literature there appears to be little information about the incidence and results of pregnancy in patients with simple goitre, though most authorities are agreed that the effect of pregnancy on existing simple goitres is to cause a further enlargement of the gland. The step-like enlargement associated with multiple pregnancies was first described in 1875 by Lawson Tait.[1] Von Graff [2] found a marked increase in volume during pregnancy in 38·5 per cent. of goitrous women. Dock [3] also states that in goitrous areas goitres frequently increase in size during pregnancy, generally diminishing rapidly in the days immediately following.

There is considerably more information as to the incidence, results, and effects of pregnancy in Graves's disease, although there is no general agreement on these problems. Of the earlier studies, those of Seitz[4] in 1913 are valuable; he collected 112 cases of exophthalmic goitre complicated by pregnancy from his own material, from the literature, and from circular letters. His conclusions were as follows. Hyperthyroidism was not affected one way or the other in 40 per cent. of the cases, whilst in a very small number it was improved. On the other hand, 67 out of 112 cases, or 60 per cent. of the total, were made distinctly worse by gestation, and in one-fourth of these there was serious menace to health and even life. Seven patients died, five aborted, and 11 had premature labours. Three miscarriages and three macerated fœtuses were recorded. Crotti[5] (1922) came to the conclusion that the majority of cases of Graves's disease were made worse by pregnancy, and that at any rate it should be regarded as a serious complication. Bram[6] (1922), as a result of extensive clinical observations, formed the opinion that premature expulsion of the uterine contents occurred only in the minority of cases of pregnancy complicating Graves's disease, and that this depended to a great extent on the severity of the disease at the time. Mussey, Plummer, and Boothby[7] (1926) investigated the problems of pregnancy in a large number of cases of exophthalmic goitre and adenomatous goitre with hyperthyroidism. Their figures, however, appear to include only patients who were pregnant at the time of observation, and do not take into account all pregnancies after the onset of the disease. In a series of 5043 cases of exophthalmic goitre they found that only 32 were pregnant. In another series of 2185 cases of adenomatous goitre with hyperthyroidism the incidence of pregnancy was only 10. In the total 7228 cases of the two groups, only 42—i.e., 0·6 per cent.—were pregnant. These incidence figures are considerably lower than those of any other observers, and the explanation appears to be that only patients pregnant at the time of observation were included. Important information, however, is given by these workers as to the effect of these diseases on the course of pregnancy and vice versa. Most of the patients with exophthalmic goitre became pregnant during a period of remission of the disease. Twenty-three patients were delivered normally at full term and all but two of the babies were alive and normal at birth. One of the two was stillborn and the other case untraced. Two patients, on the other hand, aborted, two were delivered prematurely, two were pregnant at the time of observation, and three were untraced. Of the ten women with adenomatous goitre with hyperthyroidism who became pregnant nine were delivered of normal babies. All but one of the mothers had previously had some form of operative treatment on the thyroid gland. Mussey, Plummer, and Boothby finally concluded that the association of pregnancy with these two conditions was a rare one, but that when it did occur the course of pregnancy and the maternal and fœtal mortality were not appreciably affected. They thought also that complications were not more frequent than is usual in either condition alone, and that the course of the disease was not rendered more difficult. The most recent observations on the question of pregnancy as a complication of Graves's disease are those of Hyman and Kessel[8] (1927), who studied a small series of 20 cases of Graves's disease in married women. Nine patients had 12 children; of the latter, one was stillborn and the others normal. This they think is about the average expectancy. Pregnancy, labour, and the puerperium were normal in all. The feature which these authors especially emphasise is the amelioration of the symptoms of Graves's disease which usually occurred during pregnancy. In their cases there was seldom any relapse afterwards.

Simple Goitre.

Of the 26 cases of simple goitre to be discussed, all but two were sporadic. Twelve of these had originated primarily in adolescence and persisted into adult life, while the remaining 14 had developed in adult life. It is remarkable that in all but two of this latter group the goitre developed originally during pregnancy or the puerperium. It would seem, therefore, that simple goitre, developing in adult married women at times other than these, is comparatively rare. Full

TABLE I.—*Effect of Pregnancy on Simple Goitres of Adolescence.*

No.	Age.	Goitre at.	Factors.	Married at.	Pregnancies.	Result.	Effect on goitre.
1	39	14½	F.H. goitre.	38	1 at 38½.	Prem. d. at birth.	Hyp. during.
2	35	15	Pub. 15.	24	4 betw. 25 & 33.	All N.	Steplike hyp.
3	26	16½	,, 15.	23	1 at 24.	N.	Hyp.
4	35	17	,, 17.	21	4 betw. 23 & 28; then 13 misc.	N.	Hyp. with 4th (twin) & subseq.
5	29	8	F.H. goitre.	20	2 at 21 & 25.	N.	Hyp. now. Hytm.
6	45	10	Pub. 15.	25	1 at 29.	N.	?
7	41	12	,, 16.	36	1 at 37.	N.	Hmty. at 30. Hyp. during preg., 37.
8	46	12	Typhoid.	19	3 betw. 22 & 27.	N.	Steplike Hyp.
9	49	10	Pub. 10.	34	2 at 36 & 37; 1 misc. at at 35.	N.	R. hmty., 31. L. hmty., 40. Hytm.
10	30	14	F.H. goitre. Pub. 14.	21	2 at 22 & 26.	N.	Hyp. during 2nd. Hytm.
11	46	16	,, 11.	30	3 betw. 31 & 41.	N.	Hyp. during 3rd. Hytm.
12	32	12	Pub. Mother goitre.*	23	10 betw. 23 & 32.	N. 4; 3 died, 3 misc.	Hyp. with each preg.

* Endemic area. Betw. = between. N. = Normal.
Hyp. = hypertrophy. Hytm. = hypothyroidism.
Hmty. = hemithyroidectomy.

tails of the pregnancies and their effect on the ırse of the disease in these two groups of cases have en summarised in Tables I. and II.

The incidence of pregnancy in the group of cases own in Table I. is well up to the average. Four of ese patients had one child, three had two children, o had three children, and three had four ildren each. Pregnancy was carried successfully to l term in the majority. There were three instances which the thyroid condition was perhaps responsible miscarriages. In the first, Case 4, four healthy ildren were born, and the fourth pregnancy resulted twins and was accompanied by a very marked pertrophy of the thyroid. Subsequently, symptoms hypothyroidism developed, which were not cognised or treated. This patient became pregnant 13 occasions during the next seven years, and each ne miscarried at the third or fourth month. In e second patient, Case 9, the first pregnancy resulted miscarriage. She had had a goitre since the e of 10, but a hemithyroidectomy which had been rformed just before her marriage had resulted in mptoms of hypothyroidism. As a result of treat-ent with thyroid extract, she subsequently had o successful pregnancies. In the third instance, se 12, the history was very similar to that in the st case. There was a strong family history of itre, and the family lived in a goitrous area. The tient herself developed a goitre at puberty. She arried at the age of 23 and gave birth to four healthy ildren. Six subsequent pregnancies resulted in ree stillbirths and three miscarriages. All these egnancies occurred between the ages of 23 and 32. e had not received any treatment with thyroid tract. In this case it seems probable that the yroid had become exhausted by repeated pregnancies.

The effect of pregnancy on the goitre was in the ajority of cases a further hypertrophy of the gland, d in multiparæ the steplike enlargement which was und by Lawson Tait. In both the patients on om partial thyroidectomy had been performed fore pregnancy occurred there was a recurrence of e goitre during pregnancy. As in the series of cases goitre developing in married women in adult life, ese patients also almost invariably developed mptoms of hypothyroidism in later life.

cidence, Results, and Effects of Pregnancy in Simple Goitre developing originally in Adult Life.

The details of the 14 patients in this group are ven in Table II.

The incidence of subsequent pregnancies in this oup of patients can be seen in Table II. Six of the had no subsequent pregnancy, though how far this s the result of the thyroid condition it is impossible say. It has, however, been frequently noted that yroid deficiency is often accompanied by sterility, ich can be overcome in a certain proportion of tients by treatment with thyroid extract. There no doubt that a considerable degree of thyroid ficiency was present in the majority of the cases der discussion after their first pregnancy, and from e information which could be obtained it did not pear that they had received adequate treatment th thyroid extract. The remainder, eight, of this oup of patients had had subsequent pregnancies, lf of them a single pregnancy, three two pregnancies, d one three. This is probably rather below the erage expectancy.

The development of goitre during pregnancy did t appear to have any harmful effect on pregnancy, in every patient in whom it occurred the pregnancy ring which the goitre started was successfully ried to term. In these patients also, all subsequent egnancies were successfully completed.

The effect of pregnancy on the goitre was in nearly ery case the same—i.e., a further hypertrophy of the nd. In later years the majority of these individuals veloped well-marked symptoms of hypothyroidism. here is one instance, however, Case 2 in Table III., of a goitre which was apparently unable to hypertrophy. In this patient definite symptoms of myxœdema developed after the puerperium. As a result of treatment with thyroid extract these symptoms disappeared, and two years later a further pregnancy occurred and was carried to full term with complete success.

TABLE II.—*Simple Goitre Developing in Adult Life.*

(A) *During Pregnancy.*

No.	Age.	During which pregnancy.	Result.	Subseq. preg.	Result.	Effect on goitre.	Ultimate result.
1	50	1st at 36.	N.	None.	—	—	Further hyp. at menop.
2	50	11th at 45.	N.	,,	—	—	Further hyp. at menop. with hytm.
3	38	1st at 25.	N.	2 at 27 & 35.	N.	Hyp.	—
*4	28	1st at 24	N.	2 subseq.	N.	Hyp. with each.	Hytm.
5	32	1st at 24.	N.	3 at 26, 28 & 30.	N.	,,	,,

(B) *During the Puerperium.*

6	42	2nd at 25.	N.	None.	—	—	Hmty.; pressure.
7	38	3rd at 33.	N.	1 subseq.	N.	No alteration.	No symp.
8	32	1st at 23.	N.	1 at 30.	N.	Hyp.	—
9	51	7th at 40.	N.	None.	—	—	Hytm.
10	34	1st at 32.	N.	,,	—	—	—
11	31	1st at 28.	N.	,,	—	—	Hytm. B.M.R. —26%.
12	34	1st at 28.	N.	1 at 33.	N.	Hyp.	Hytm.

(C) *At other times.*

No.	Age.	Goitre at—	Factors.	Preg-nancies.	Result.	Effect on goitre.	Ultimate result.
13	31	27	Endemic.	1 at 30.	N.	Hyp. during.	—
14	43	21	?	2 at 32 & 35.	N.	Myx. after 1st preg.	Myx. Treated with thyroid before 2nd.

* F.H. goitre. Myx. = Myxœdema.
Menop. = Menopause.

Primary Graves's Disease.

The disease in eight of the 71 cases of primary Graves's disease originally developed during pregnancy. In six this had no adverse effect on the pregnancy, which pursued a normal course to full term. In the seventh patient, although the pregnancy was carried to full term, the child was stillborn. The eighth patient miscarried at three months, very shortly after the onset of the disease. It may be concluded, therefore, that primary Graves's disease developing during pregnancy in the majority of cases—in this instance 75 per cent.—does not materially affect the course of pregnancy.

In 40, or 56·3 per cent. of the 71, the patient was first seen within two years of the onset of the disease, during which time there had been little possibility of a subsequent pregnancy. The majority were either in hospital or under active medical supervision for the greater part of this time. These cases, therefore, can be eliminated from the discussion. Details of the remaining 31 patients (43·7 per cent.) are given in Table III. In these cases an interval of two years or more had elapsed since the onset of the disease.

From Table III. it can be seen that pregnancies occurred in 17, or 54·8 per cent., of the 31 cases in which the interval of time after the onset of the disease was sufficiently long to have made it a possibility. In spite of the fact that a relatively high

proportion of patients (54·8 per cent.) became pregnant after the onset of the disease, there are few instances of more than one pregnancy occurring—only four in this series. One of these women had three normal children, two had two miscarriages, and the other, after a stillborn child followed by a miscarriage, ultimately had a normal and successful pregnancy.

TABLE III.

No.	Age.	Duration ex. goitre in years.	Subseq. preg.	Result of preg.	Date of preg. after onset of Graves's disease.
1	37	3	0	—	—
2	43	15	0	—	—
3	36	7	1	N.	Within 2 yrs.
4	38	8	1	N.	,, 1 yr.
5	34	4	3	(1) Full-term stillbirth.	,, 2 yrs.
				(2) Misc. 3/12.	,, 2½ yrs.
				(3) N.	,, 3½ yrs.
6	45	19	0	—	—
7	35	5	1	N.	,, 5 yrs.
8	37	3	0	N.	—
9	26	3	1	—	—
10	44	5	2	Misc. 6/12.	,, 3 yrs.
11	53	16	0	(1) Misc. 2/12.	,, 3 yrs.
				(2) ,, 4/12.	,, 4 yrs.
12	56	?	3	(1) N.	?
				(2) N.	?
				(3) N.	?
13	48	?	1	Misc. at 5/12.	Within 5 yrs.
14	42	6	1	N.	,, 2 yrs.
15	48	9	0	—	—
16	24	2	1	Pregnant at time of obs.	Within 2 yrs.
17	41	?	0	—	—
18	42	4	0	—	—
19	32	3	0	—	—
20	29	4	0	—	—
21	28	2	2	(1) Misc. at 5/12.	Within 2 yrs.
				(2) Misc. at 3/12.	,, 2 yrs.
22	42	5	1	Misc. at 3/12.	,, 4 yrs.
23	28	7	1	N.	,, 6 yrs.
24	43	11	0	—	—
25	39	8	0	—	—
26	36	5	1	Born dead.	Within 5 yrs.
27	36	5	1	Misc.	,, 4 yrs.
28	41	13	0	—	—
29	54	14	1	N.	Within 2 yrs.
30	29	2	1	Prem. 7/12.	,, 2 yrs.
31	55	20	0	—	—

The Effect on Each Other of Graves's Disease and Pregnancy.

A summary of the results of pregnancy (also given in Table III.) in the 17 cases in which it occurred shows that out of a total of 23 pregnancies 10 were completed normally. On the other hand, there were nine miscarriages, one premature birth, and two full-term stillborn children, while one patient was pregnant at the time of observation. To put this in slightly different form, rather more than half—54·5 per cent.—of the pregnancies were unsuccessful, miscarriage and premature expulsion of the uterine contents generally occurring. The early stages of pregnancy appear to be slightly more dangerous than the later, for the majority of the miscarriages occurred in the first four months. From the present observations it does not seem possible to obtain any guide to the prognosis of pregnancy in any individual case. The result appears to depend more on the severity of the disease at the time of pregnancy than on the length of time during which the patient has suffered from it. Although five normal pregnancies occurred in patients who had suffered from the disease for a short period—three years or less—the number of unsuccessful pregnancies in these early cases was somewhat greater. Miscarriages were also more common in the patients who had suffered from the disease for a longer time. Unfortunately, no information was available as to the dates of the three normal pregnancies in relation to the onset of the disease in Case 12, so that they could not be included. Taken as a whole, however, my experience does not indicate that the length of time the patient has suffered from the disease has any relationship to the prognosis of pregnancy.

It has frequently been observed that the symptoms of Graves's disease improve during pregnancy. Hyman and Kessel,[8] for instance, found an amelioration in their series, and many did not relapse afterwards. Mussey, Plummer, and Boothby[7] though that the course of the disease was not adversel affected. The details of the effect of pregnancy on th disease in the present series, where the informatio was available, have been summarised in Table IV.

TABLE IV.

Symptoms improved—		
During and after.	During, but relapsed after.	During; hypothyroidism after.
8.	9.	2.
Stillbirth (F.T.).	Normal.	Normal.
Normal.	,,	,,
,,	Misc. 3/12.	—
,,	,, 6/12.	—
,,	Normal.†	—
Misc. 3/12.	Premature 7/12.	—
Normal.	,, 7/12.	—
Misc.*	Misc. 5/12.	—
	Stillbirth (F.T.).	

* Previously treated by X rays.
† Relapsed owing to illness of child.

In no instance were the symptoms exaggerate during pregnancy. In eight patients, 42 per cent an improvement occurred during pregnancy witho any subsequent relapse, whilst in nine patient 47 per cent., the improvement was not maintaine In two women an improvement during pregnancy wa followed by hypothyroidism. If these two cases a included with those of the first group, it can b concluded that in about half the patients the improv ment in the symptoms of the disease which occurre during pregnancy was more or less permanent, whil in the other half there was a relapse. To some exte this question of permanent improvement or relaps seems to depend on successful termination of th pregnancy. This is shown in Table IV. Unfortunatel information was only available in 19 of the 2 pregnancies. In the first column of this table, whe improvement was maintained, there is a high percentage of normal pregnancies than in the secon column, where it was not, the actual proportion normals being 62 per cent. in the first column against 33 per cent. in the second. To some exte psychological factors appear to be responsible for th relapse for, in the patients who miscarry or in who the pregnancy is not successfully terminate anxiety and disappointment at the turn of events a often advanced as the reasons for the deterioration. I others, the relapse may be due to anxiety over th subsequent illness of the child, an instance of which seen in one of the cases in the second column of th table, where the actual pregnancy was successfull completed. There can be little doubt from the figures that an exacerbation of symptoms is partic larly likely to occur after miscarriage, but is not common after a full term and successful pregnanc

A good individual instance of this is the following patie who had repeated miscarriages and ultimately a successf pregnancy. In the first place she miscarried at three month shortly after the onset of the disease, whereupon t symptoms gradually became worse. Under treatmen however, during the next six months, her condition improve About this time she again became pregnant, and duri pregnancy the symptoms of Graves's disease, including t exophthalmos and goitre, entirely disappeared. T pregnancy continued satisfactorily to full term, but the chi was stillborn. There was no return of the symptoms Graves's disease after childbirth. Four months later t patient again became pregnant and on this occasion m carried at nine weeks. As a result of this, all the symptom of Graves's disease returned, and a few months later h basal metabolic rate was found to be +59 per cen indicating a fairly severe intoxication. During the ensui year she improved under medical care and treatment, and the end of this time she again became pregnant. Again t

symptoms of Graves's disease entirely cleared up during pregnancy. At the fourth month her basal metabolic rate was normal (+5 per cent.). Pregnancy was carried successfully to full term and a normal, healthy child was born. One year after this pregnancy there had been no return of the symptoms of Graves's disease. The interesting features of this case are the improvement in the symptoms during pregnancy and their exacerbation after miscarriage, also the permanent improvement when the final pregnancy was carried successfully to full term.

The exacerbations after miscarriage could no doubt to a large extent be attributed to the mental condition of the patient, though it seems more than probable that other factors play a part in this phenomenon. It might, for instance, be suggested that when miscarriage occurs the normal involution and readjustment of glandular functions does not take place in the way that it appears to do when pregnancy is successfully completed.

An improvement in the symptoms was almost invariably noted during pregnancy. This improvement was generally maintained afterwards if the pregnancy was successfully carried to term. The most important factors in producing a satisfactory result seem to have been absence of mental stress and anxiety and adequate rest and treatment during pregnancy. When these conditions were fulfilled, the results were comparable to those of Hyman and Kessel. An amelioration in the symptoms during pregnancy was not followed by relapse afterwards. Unfortunately, in about half the cases in the present series these conditions were not attained.

Secondary Graves's Disease.

Of the 18 cases of secondary Graves's disease the primary simple goitre in 11 had persisted from adolescence, whilst in seven it had originated in adult life. The majority of the adolescent goitres first appeared about the time of puberty. In three of the adults the goitre originated during pregnancy. In a few cases there was a strong family history of goitre, but in only one instance had the patient lived in a goitrous area. The histories suggest that before the onset of thyrotoxic symptoms the goitres were in every way comparable with those already described in the section dealing with simple goitre. Before the onset of thyrotoxic symptoms the incidence of pregnancy was approximately the same as in the cases of simple goitre; pregnancies occurred in 61 per cent., whilst in the remainder, 39 per cent., there was sterility. Secondary thyrotoxic symptoms developed usually between the ages of 27 and 42; the exciting factors were shock, mental stress or sepsis, alone or in combination. There were no instances of secondary thyrotoxic symptoms developing during pregnancy or the puerperium, an observation of some interest when it is considered how frequently primary Graves's disease develops during these periods.

Pregnancy after the onset of thyrotoxic symptoms was rare in the present series. It must be pointed out, however, that in nine, or 50 per cent. of these patients, when they came under observation, the interval of time which had elapsed after the onset of thyrotoxic symptoms was insufficient to have permitted a subsequent pregnancy. The details of the pregnancies in the remaining nine cases are given in Table V.

TABLE V.

No.	Age.	Secondary Graves's disease at—	Interval of time elapsed in years.	Pregnancies.	Result.
1	63	42	21	0	—
2	28	20	8	0	—
3	53	36	17	0	—
4	45	35	10	1	N. F.T.
5	39	36	3	0	—
6	37	28	9	0	—
7	53	36	17	0	—
8	45	28	17	2 at 33 & 36.	N. F.T.* N. F.T.*
9	37	34	3	0	—

* Both marasmic and died shortly after birth.

Pregnancies occurred in only two of these nine patients after the onset of thyrotoxic symptoms. One had two normal pregnancies and the other had one. In the former case both children were marasmic and died shortly after birth. In this patient the symptoms of the disease were very considerably exaggerated as a result of pregnancy, an indication of which was a basal metabolic rate of +81·7 per cent. shortly after parturition. In the other patient an exaggeration of the symptoms of the disease was pronounced one year after pregnancy.

Summary and Discussion.

The presence of a persistent simple adolescent goitre does not appear to affect the normal incidence of pregnancy, which in the group of cases under investigation was well up to the average. The expectancy of pregnancy in these cases was also practically normal, though there were several instances of a series of miscarriages following repeated pregnancies in patients whose thyroid condition had been untreated and in whom there were definite signs of hypothyroidism. The effect of pregnancy on the goitre in these "primarily adolescent" cases was in almost every instance the same—i.e., a further hypertrophy of the gland. In spite of this, most of these patients developed well-marked signs of hypothyroidism in later life.

The incidence of pregnancy in the group of patients who developed a simple goitre in adult life was below the average expectancy; in fact, only about 50 per cent. of them became pregnant at all. No harmful effect was noted on the pregnancy in any of these "adult" cases, though it was usually associated with a further hypertrophy of the gland, and later with well-marked symptoms of hypothyroidism.

Pregnancy as an event complicating primary Graves's disease occurred in about half the cases in which it was possible, but more than one pregnancy after the onset of the disease was comparatively rare. The results of pregnancy in these cases were poor, for there was an unsuccessful termination by miscarriage or premature birth in about 50 per cent. During pregnancy there was almost invariably an amelioration of the symptoms. In about 50 per cent. of cases this improvement was maintained afterwards.

The incidence of pregnancy in secondary Graves's disease was low, only two instances occurring out of nine cases in which it was possible. The results of pregnancy and the effects on the subsequent course of the disease were unsatisfactory, but the number of cases in this group was too few for definite conclusions.

The practical bearing of these facts appears to be as follows: A patient with a simple goitre, whether it originally develops in adolescence or in adult life, may be safely advised to entertain the prospect of pregnancy. The thyroid condition, however, should be treated by some form of thyroid extract, both during and after the event. If this is not done, although the prospects of a successful pregnancy do not appear to be decreased except in those patients who have already borne several children, a further hypertrophy of the gland is almost certain to occur, and symptoms of hypothyroidism will usually develop in later life, in a few cases fairly rapidly after pregnancy. The problem of pregnancy in Graves's disease is more complicated. The incidence figures in the present series of cases agree fairly closely with those of Seitz, but differ considerably from those of Hyman and Kessel, and Mussey, Plummer, and Boothby. These latter authors came to the conclusion that the association of pregnancy with exophthalmic goitre and adenomatous goitre with hyperthyroidism was rare (0·6 per cent.), but that when it did occur the course of pregnancy and the fœtal mortality were not appreciably affected. In the present series of primary Graves's disease the incidence of pregnancy was 50 per cent. of the possible cases. The discrepancy in

these observations is, therefore, considerable. The most probable explanation of the difference appears to be that while Mussey, Plummer, and Boothby based their calculations on the number of patients who were actually pregnant at the time of observation, in the present series of cases the details of all pregnancies, past and present, occurring after the onset of the disease, have been taken into consideration. This method appears to give more reliable incidence figures.

There is a difference also in the "results" of pregnancy in these investigations. Hyman and Kessel, and Mussey, Plummer, and Boothby found that they were well up to the average. The present results, on the other hand, agree more closely with the earlier one of Seitz. His statistics were collected from cases of his own, from the literature and from circular letters, and it is probable that they refer to a period before the extensive use of iodisation and surgical operation in the treatment of Graves's disease. This is also true of many of the present cases. It is possible, therefore, that this may account for the variation. To a large extent the poor results of pregnancy in the present series—miscarriage or premature birth in 50 per cent.—may be attributed to shocks, mental stress, and inadequate rest and treatment, for where satisfactory conditions were attained and mental stress was absent the results were generally good. The importance of taking every precaution to ensure a full term pregnancy in patients with Graves's disease cannot be overestimated. From this point of view the results in the present series are of considerable interest. In nearly every case an improvement in the symptoms of the disease was noted during pregnancy, this observation being in agreement with the findings of Hyman and Kessel, whilst the question of permanent improvement or not seemed to depend on whether the pregnancy was successfully completed or prematurely terminated. In the cases which relapsed after pregnancy there was more often than not a history of miscarriage or premature birth. On the other hand, when the pregnancy was carried to a successful termination, the improvement in the symptoms was generally maintained. It seems, therefore, that the prospect of pregnancy may be entertained by a patient suffering from primary Graves's disease if circumstances are favourable and previous treatment adequate, the degree of intoxication not too great, and cardiac and other complications absent. Under such circumstances there seems to be a good chance of pregnancy being carried to term, in which case there is an equally good chance of the disease being permanently benefited. The outlook in secondary Graves's disease, on the other hand, as judged by the few instances of pregnancy in the present series of cases, does not appear to be so satisfactory.

I wish to thank Prof. MacLean, the Director of the Medical Unit, the members of the staff of St. Thomas's Hospital, and the Medical Research Council for the facilities which enabled me to carry out this investigation.

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THE "STIGMA OF PAUPERISM."—To prevent "any stigma of any kind suggesting itself to the mind of anyone making use of poor-law institutions" the Ministry of Health has sanctioned the alteration of the name of the Walsall Workhouse Infirmary to "The Manor Hospital"; the workhouse itself is to be called "Beacon Lodge." The Ministry has also approved of the appointment of a consultant physician and a consultant surgeon to avoid sending special cases to Birmingham.

LYMPHOMATA OF THE ORBIT.

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THE recent article on chloroma by Ashby and Smith in THE LANCET (1928, i., 1169) stimulated me to make a survey of the records of this hospital since 1915 (inclusive) in order to pick out the various conditions of the orbit which might conveniently be called lymphomata. I had previously formed the opinion that lymphomata (lymphocytoma or lymphoblastoma) of one sort or another, although actually rare, are relatively among the commonest neoplasms of this region, if the term neoplasm include nodular collections of lymphoid tissue occurring without any relation to other definitely recognisable pathological changes. A benign localised lymphomatous aggregation (e.g., a flattened mass under the bulbar conjunctiva) is not usually regarded as a neoplasm, but my use of the term is convenient and will be clear.

Two true neoplastic conditions are outstandingly frequent in this district—namely, epithelioma arising in connexion with the lids or limbus, and retinoblastoma (glioma or neuro-epithelioma), which has usually extended to the orbit before the patient comes to hospital. The figures for epithelioma and retinoblastoma during the past eight and a half years were 35 and 23 respectively. During this period I personally examined the cases and the orbital tissues removed for diagnosis. The 23 cases tabulated below represent approximately 250,000 out-patients in 13½ years.

The *bilateral* conditions may conveniently be considered in the following groups: (*a*) as an affection involving primarily the lacrymal glands (in so far as the orbit is concerned), and (*b*) as an affection not necessarily involving the lacrymal glands, or involving them secondarily in addition to other parts of the orbit.

Lane,[1] who has made a most extensive study of the literature dealing with lacrymal gland tumours, places them in three divisions: (1) the true neoplasms (mixed tumour, carcinoma, &c.); (2) cysts; (3) symmetrical tumour-like enlargements due to Mikulicz's syndrome or lymphomata as these enlargements are often called. These are not true tumour growths, but a syndrome of unknown ætiology.

Four types of this third division are described in the literature:—

Type 1 is Mikulicz's disease or syndrome proper, in which there is a bilateral lymphomatous enlargement of the lacrymal glands, together with enlargement of one or more of the salivary glands without characteristic blood changes, usually of favourable prognosis, but capable of passing into Type 3.

Type 2.—Bilateral lymphomatous enlargement of the lacrymal glands, without salivary gland enlargement, but with lymphatic glandular enlargements elsewhere, possibly also with blood changes which have not the characteristics of a leukæmia. This is a pseudo-leukæmia, of favourable prognosis as a rule, but it may pass over into Type 3.

Type 3.—Bilateral enlargement of the lacrymal glands and possibly (but not necessarily) also of salivary glands, lymph glands, liver, and spleen, associated with a profound leukæmia either of a lymphocytic or myelocytic type, invariably fatal.

Type 4.—A bilateral lymphomatous condition of the lacrymal glands associated with hyperplasia of the gland itself, the lymphoid elements merely increasing pari passu with the epithelial elements.

The above grouping is, with minor differences, that given by Lane, who points out the much greater frequency of the conditions included under Division 3 as compared with the true neoplasms and cysts. This relative frequency is also apparent in my survey. I shall not attempt to detail the various true neoplasms that I have met with in connexion with the lacrymal gland; they are few compared with the lymphomatous conditions.

Cases recorded from this hospital prior to 1915 coming under division 3 are included in Lane's

bibliography. Since then all our cases as tabulated below are recorded,[2] except two of which the notes are now given.

CASE 1 (*Group (a), Type 1*).—Male Hindu, aged 26, was admitted on April 7th, 1928. There was proptosis of both eyes and exposure keratitis; the left cornea was ulcerated below and there was considerable conjunctival discharge. The pupils were active, but the movements of the eyeballs were restricted in all directions. The condition had lasted a month. Fundus examination showed hyperæmia and slight swelling of the right optic disc with an indistinct nasal margin. No fundus view of the left eye could be obtained owing to corneal ulceration and œdema: Right eye vision = fingers at 4 metres; left eye vision = fingers at 2 metres. The patient was very emaciated and anæmic, with coated tongue and marked pyorrhœa alveolaris. The liver was enlarged and the spleen normal. The patient was pigeon-breasted, had some dyspnœa, with wheezing respirations more frequent than normal, dullness over the right lung, slight dullness over the left base, and diminished breath sounds all over. Vocal resonance was increased on the right side.

Both lacrymal glands were enlarged as was also the right preauricular and the posterior cervical glands, as well as the parotid and submaxillary salivary glands on either side. The urine was normal. No ova of intestinal parasites were found and the Wassermann was negative. The blood count was as follows: red cells, 3,587,500 per c.mm.; white cells, 5625 per c.mm.; polymorphonuclear leucocytes, 44 per cent.; large mononuclear leucocytes, 10 per cent.; lymphocytes, 40 per cent.; eosinophils, 2 per cent.; basophils, 2 per cent.; transitional forms, 2 per cent.; hæmoglobin, 57 per cent.

Tarsorrhaphy of both eyes was done on April 7th and the patient was transferred to the General Hospital for nursing on April 14th. On May 3rd he returned with the mouth, eyes, and chest much improved. On May 5th a 12·5 mg. radium needle was inserted deep in the lacrymal gland mass on either side, parallel with the roof of the orbit. These were removed after 26 hours (325 mg. hours). A blood count on May 12th showed: red cells, 4,500,000 per c.mm.; white cells, 6250 per c.mm.; polymorphonuclear leucocytes, 50 per cent.; mononuclear leucocytes, 26 per cent.; lymphocytes, 20 per cent.; eosinophils, 4 per cent.; hæmoglobin, 70 per cent. On May 25th the orbital masses were markedly diminished; that on the right side could not be palpated, the left was just palpable. The right parotid was not so large, but the submaxillary glands were much the same. A piece of tissue removed for pathological examination on May 27th showed the Mikulicz picture considerably altered, marked fibroblastic changes having supervened. The lid adhesions were divided; the corneæ and conjunctivæ were healthy. On discharge next day: R.E.V. = 6/24 N.I.G.; L.E.V. = 6/36 N.I.G.

Radium rapidly reduced the size of the lacrymal growths. In two previous cases of this type the enlargements were reduced by X rays.

CASE 2 (*Group (a), Type 3*), *bilateral enlargement of lacrymal glands with leukæmia*, was an Indian girl of 7, who attended on May 28th, 1927, with proptosis of both eyes. The right cornea was ulcerated. It was said that the bulging had only been noticed for 20 days. A tumour mass was felt on either side between the eyeball and the orbital rim, that on the right being larger. The child had fever of a low type and was anæmic. No other glands were involved; the spleen and liver were normal. The blood showed: red cells, 4,760,000 per c.mm.; white cells, 24,375 per c.mm.; polymorphonuclear leucocytes, 24 per cent.; large lymphocytes (mononuclear), 44 per cent.; small lymphocytes, 13 per cent.; neutrophil myelocytes, 16 per cent., eosinophil myelocytes, 3 per cent.; hæmoglobin, 46·65 per cent. The Wassermann was negative. The urine contained 0·5 per cent. of albumin. A few of the monocytes contained rod-shaped bodies staining red with Leishman's stain. The patient was not treated, was discharged at request, and died.

The cases of this type had certain points in common. They were all fatal and organic arsenic did not appear to influence the condition. The blood picture varied from myelocytic to lymphocytic. The rod-shaped bodies in the monocytes were previously described[3]; blood cultures in this case, both at blood heat and in the cold incubator, were negative, and Colonel R. Knowles considered the inclusions non-organismal. Hudson does not mention them.[4]

A practical point worth noting is that in most cases either of Type I. or Type 3 exposure of the cornea is an urgent condition calling for prompt relief, for it dries and eventually ulcerates from exophthalmos and lack of lacrymal secretion. Tarsorrhaphy is a simple and efficient method of preventing loss of the eye from this cause. It gives time for treatment either by radiation or operation, and in the latter event diminishes the risk of sepsis in the dead space. As in the case described above, the lids may be opened after diminution of exophthalmos and before discharge of the patient. It seems reasonable to presume that all lymphomata not associated with leukæmia are radio-sensitive. Anyhow, X rays or radium would be well worth trying in lymphomatous conditions suspected or verified by the removal of a portion before extirpation.

Affections not Necessarily Involving the Lacrymal Glands.

There appears to be only one case in our records suitably included under Group (*b*). This was originally recorded by Colonel H. Kirkpatrick in 1916[5] as bilateral sarcoma. The neoplastic masses were at first most prominent in the lower part of the orbit. That it was not a true sarcoma was proved by the later history. In 1922 the case came under my care again and an exenteration of the left orbit was necessitated.[2] Apparently by this time the process had involved the lacrymal glands in addition to all the other structures of the orbit. There was recurrence in the socket, but it was controlled by X rays. No further development took place on this side, and on the right the condition apparently subsided altogether. Here the condition was a bilateral lymphoblastoma of a benign type, not necessarily affecting the lacrymal gland except by extension. It might be classified as: Group (*b*), Type 1, which might also include such bilateral lymphoblastomatous conditions as described by McAll.[6] I have seen two like the first case published by Bedell,[7] but bilateral. They showed lymphomatous masses under the bulbar conjunctiva, rather resembling pieces of smoked salmon, which extended backwards into the orbit over the muscle insertions.

Chloromata affecting the orbit might be placed in Group (*b*), Type 2. Those recently recorded by Ashby and Smith[8] and Cohen,[9] for example, show affinities with Group (*a*), Type 3, above. They have the common characteristics of a rapidly fatal leukæmia appearing in children. They differ in the type of orbital involvement and the colour of the new-formed tissue. The nature of the cells in the masses is chiefly myelocytic, but apparently may be lymphocytic, in which case the orbital involvement would be lymphoblastic. In chloromata there are bony foci which are not met with in Class (*a*), Type 3. I have not seen a case of chloroma in this hospital, but the literature suggests that the lacrymal gland was sometimes secondarily involved.

A third type is discrete lymphomatous invasion of all the tissues of the orbit by small isolated nodes, as described by Coats.[10] I have seen one example which has not been reported up to now and may be briefly referred to.

CASE 3.—A female Hindu, aged 40, came under my care in June, 1925, with a proptosis of the right eye of 25 mm. The left orbit had been exenterated in this hospital eight years before. On looking up the old records and examining sections of the tissues it appeared that after the exenteration no tumour had been discoverable, but there had been discrete lymph nodes throughout the whole orbit, as in Coats's case. These had been frequently related to vessels which appeared to be unduly prominent in the tissues. Blood examination had been negative and there was no record of the fundus appearances. When I saw the woman she said that the right eye had begun to bulge a year before. Vision was 6/6. There was some œdema of the disc and dilatation and humping of the vessels. The Wassermann was negative and the blood normal. There was mitral regurgitation. The thyroid was slightly enlarged. The physicians did not consider that there was Graves's disease, but there was a doubtful lesion (? tumour—not aneurysmal) of the upper mediastinum. The cornea was protected by tarsorrhaphy, and the woman took her discharge.

Unilateral Lymphoma.

The unilateral lymphomata of the orbit may similarly be considered in two groups: (*a*) an affection involving primarily the lacrymal gland, and (*b*) an affection not necessarily involving the lacrymal

gland or involving it secondarily. The lacrymal gland is one of the main sites of distribution of normal lymphoid tissue in the orbit. It may therefore be significant to remember that small isolated portions of lacrymal gland tissue may occur all round the upper fornix, in the tarsus, and even round the lower fornix, and that phylogenetically the gland mass has migrated to its present site from below temporalwards and upwards.

In Group (*a*) there are three types: (1) an enlargement of the gland of the Mikulicz type with salivary gland changes, (2) a hyperplasia of the gland with simultaneous increase of lymphoid tissue, and (3) a lymphomatous condition arising in the gland without enlargement of salivary glands or lymph glands, and without evidence of pseudo-leukæmia or leukæmia, such as the case recorded by Pfingst.[11] Of this type I had an excellent example this year. The large lymphoid mass caused marked displacement of the globe. The cornea was saved by a tarsorrhaphy and the mass reduced by partial excision and subsequent X ray treatment. Presumably such a condition may pass over into one of the bilateral types such as (*a*), 1, 2, or 3, but Pfingst's case showed no change three years after discharge from hospital.

In Group (*b*) may be included lymphomatous masses of any sort in the orbit, whether starting under the bulbar conjunctiva (e.g., the first case recorded by Bedell)[8] under the palpebral conjunctiva, or deeper in the orbit.

Bilateral.

(*a*)	(*b*)
Type 1.	One case (1916).
Five cases Mikulicz's syndrome. 1922, 1923, 1924, 1925*, 1928	
Type 2. Nil.	Nil. (Chloroma.)
Type 3.	One case (1925). Discrete lymphomatous infiltration (Coats).
Five cases leukæmia 1918, 1920, 1922, 1926, 1927	
Type 4. Three cases hyperplasia.	

* Not recorded in detail except in our laboratary records.

Unilateral.

(*a*)	(*b*)
Type 1. One case (Mikulicz) (1926).	Five cases: One each— Extending from neighbourhood of plica.
Type 2. Nil. (It is thought that an example occurred, but the notes cannot be traced).	Extending underneath the bulbar conjunctiva and backward.
Type 3.	Extending from upper lid.
Two cases .. 1922, 1928	Main mass in inferior temporal region of orbit.
	Main mass just below brow.

Two of the bilateral cases of Type 3 (*a*) showed a blood picture indistinguishable from myelogenous leukæmia. Coats[10] states that in myelogenous leukæmia local tumours are rare and do not appear to have been recorded in the orbit. In making this statement he must have considered that the leukæmia met with in bilateral lymphoblastoma of the lacrymal gland is not truly myelogenous. Inflammatory aggregations of lymphoid granulation tissue have been excluded and also localised infiltrations confined to the palpebral conjunctiva and lids. There is no doubt that other cases presenting themselves at the out-patient department might have been added to the 20 here tabulated had they been accurately written up. This may seem a very small number when one considers the approximate number of out-patients during the period which the survey covers, but although actually rare apparently these conditions come third in frequency amongst the orbital growths in this part of the world.

I have to thank the various members of the staff for their assistance, more particularly Dr. Kandaswami Pillay for his great help both in the laboratory and in the verification and assembling of records.

(*Continued at foot of next column.*)

ESTIMATIONS OF LEAD IN TISSUES

OF LEAD-TREATED PATIENTS AND ANIMALS.*

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The lead treatment of cancer has made it desirable to obtain information about the distribution of intravenously injected lead preparations among the tissues of the patient. Such information is of toxicological importance, and should be significant in determining the manner and kind of lead treatment as well as the auxiliary measures to be adopted—for example, the subsequent elimination of the lead. Little information on this subject is available. In most of the experimental work on animals discussed by Aub *et al*[1] the lead was introduced otherwise than intravenously, and the information obtained was sufficient to show that the mode of introduction of lead has a considerable influence on its distribution. N. Waterman[3] gives the results of lead estimations made on the tissues of one lead-treated cancer patient, obtained post mortem. While the tumour contained 102 parts per million of lead, the organs contained much less, the spleen showing the highest content with 55, followed by liver, bone, lung, and kidney. The drug employed was apparently similar to the electrically-prepared colloid used by us. In three cases of Rous fowl sarcoma treated by the same author with lead undecylate, although the treatment retarded the progress of the disease, the results are not quite so definitely in favour of the original tumour having the highest lead-content of any tissue. The ovary showed in one case the highest lead-content of any observed in the series. Apart from this, either the original tumour or the lung (when there were pulmonary metastases) contained the largest quantity of lead. Moreover, Waterman found that tumours treated with lead in vivo were not so readily transplanted as untreated neoplasms.

The present paper records findings concerning the lead-content of normal and neoplastic tissues after treatment with lead. These are rather fragmentary but should be of some value; so far as they go, they lend support to the view that the lead-content of malignant tissue is higher after treatment than

* This investigation was undertaken on behalf of the Liverpool Medical Research Organisation.

Lieut.-Colonel Wright: References.

(*Continued from previous column.*)

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that of normal tissues from the same subject. Two experiments are also reported in which cats heavily treated with lead were killed a few hours later. They provide information on the immediate localisation of the lead after intravenous injection.

Analytical Method.

The wet tissues, after being weighed and roughly dried, were incinerated in an electric muffle furnace at 550–600°C. The ash was brought into solution by several extractions with hydrochloric acid. (The method followed is essentially that of Fairhall,[1] but it is thought desirable to specify some of the details, as few are given by this author.) The acid solution was then treated with caustic soda to bring the pH to a value of about 1·5 or more, as high a pH being reached as is consistent with avoiding precipitation of phosphates. Methyl violet was the indicator used. The solution, after being thoroughly bubbled with sulphuretted hydrogen, was allowed to stand overnight and then filtered through Whatman No. 40 filter paper. The precipitated lead sulphide was washed with sulphuretted hydrogen water and dissolved in hot nitric acid. The solution was neutralised with strong caustic soda and then made acid to phenolphthalein with acetic acid, a little solid sodium acetate being added to keep down the acidity. A few crystals of potassium chromate were added to the hot solution, and this was allowed to stand a few days. The precipitated lead chromate was then thoroughly washed on the filter with dilute sodium acetate solution, which serves to prevent the precipitate from passing through the filter. The lead chromate was brought into solution with dilute hydrochloric acid, and titrated at once with N/200 thiosulphate in the usual way, after adding potassium iodide. The iodine-starch colour tends to return after completion of the titration much more rapidly than when pure lead salts are being analysed; iron as an impurity may be the cause of this. The effect is variable, and is sometimes enough to make the values rather uncertain. It might perhaps be eliminated by precipitating the lead as sulphide twice.

The method used in the present work is not entirely satisfactory, as amounts of lead below 1 mg., and especially below 0·5 mg., are not accurately estimated. For a number of reasons, such methods as that involving the use of radioactive isotopes [2] or electrometric estimation of lead, which is being studied by our colleague, Dr. H. Millet, appear more promising.

Experimental Work on Lead-treated Cats.

Cats were given intravenous injections of an electrically-prepared lead colloid (about 0·5 per cent. of lead). The injections took place over a period of several hours, and the animals were killed an hour or two later. Thus there was no time for excretion of lead, and the distribution of the metal represents the state of affairs very soon after injection. Cat 1 received 365 mg. of lead and Cat 2 500 mg.; both animals weighed about 2·7 kg. The dosage was thus extremely heavy. (Tables I. and II.)

TABLE I. (Cat 1).

Tissue, &c.	Wet weight in g.	Mg. of lead.	Parts of lead per million.
Liver	80·9	149·6	1850
Lung	38·6	12·8	330
Bone (with marrow)	44·1	1·53	35
Kidney	10·6	0·98	90
Muscle	243·2	0·69	3
Blood	4·1	0·63	150
Heart	7·05	0·14	20
Large intestine (with contents)	76·7	0·0	0

TABLE II. (Cat 2).

Liver	75·8	207·1	2730
Lung	10·6	73·4	6920
Intestine and stomach	116·7	68·7	590
Blood	68·4	19·9	290
Kidney	18·7	4·1	220
Bone (with marrow)	25·5	2·65	100
Heart	6·35	1·87	290
Muscle	139·4	0·33	2
Brain	21·2	0·20	10
Urine	16	0·11	8
Intestinal contents	28·2	0·04	1

The figures evidently refer to a state of affairs when a fair amount of lead is still in circulation. The liver contains about 40 per cent. of the total lead injected. The discrepancy between the values for lung is partly accounted for by the fact that in Cat 2 the blood was largely squeezed out of the lung before circulation stopped. The liver and lung evidently take up the most lead. (Unfortunately the lead-content of the spleen was not estimated in these experiments. In later work, in conjunction with Miss Haworth, this organ was found to take up a relatively large amount). Bone, or more probably bone-marrow, is already taking up lead. Muscle takes up very little. The passage of lead into the intestine has apparently not yet begun.

Behrens [2] has made a study of the localisation of lead soon after injection of very small doses of lead chloride into young cats. As would be expected, the lung takes up a smaller proportion of the much more finely dispersed material. The liver-content preponderates, this organ taking up some 20 per cent. of the lead administered.

Lead Contents of Human Tissues.

The tissues were obtained at operations or after death from cancer patients treated with lead in Liverpool. In one case the placenta from a patient who was treated with lead for carcinoma of the rectum from the 20th to the 34th week of pregnancy, was examined after delivery. In Table III. the cases are so arranged that those which had most recently received injections come first. In estimating the value of the figures, it should be remembered that

TABLE III.

Case No.	Days since last injection.	Tissue.*	Wet weight of tissue in g.	Lead found in mg.	Lead in parts per million.
1	9	Primary carc. of breast.	24	0·37	15
		Secondary carc. of liver.	90	3·71	41
		Liver, in neighbourhood of, and containing growth.	299	3·17	11
		Uterine fibroid.	5	0·57	110
		Kidney.	145	3·34	23
		Lung.	372	0·15	4
		Bone.	90	0·33	4
		Spleen.	142	0·01	0
2	9	Bone.	55	2·91	53
		Liver.	477	13·9	29
		Kidney.	67	1·69	25
		Spleen.	164	3·95	24
		Brain.	270	1·92	7
		Lung.	253	1·54	6
3	23	Primary sarc. of leg.	74	3·3	45
4	36	,,	197	2·22	11
5	40	Placenta, full term.	(500)	0·27	5
6	44	Sarc., retroperitoneal.	604	2·19	3·6
		Spleen.	101	4·12	41
		Kidney.	241	2·97	12
		Bone.	101	0·96	10
		Lung.	441	3·1	7
		Liver.	1054	4·8	4·5
7	48	Primary sarc. of muscle of thigh.	104	0·68	7
8	84	Periosteal sarc.	108	1·26	12
		Muscle (adjacent).	363	3·56	10
		Bone.	128	0·11	1
9	307	Lung.	30	0·10	3
		Cerebellum.	134	0·22	2
		Spleen.	25	0·06	2
		Liver.	59	0·11	2
		Cerebrum.	793	0·69	1
		Kidney.	38	0·03	1
		Bone.	47	0·0	0

* In Cases 2 and 9 no tumour tissue was examined.

where the amount of lead found was small the figures are not considered very reliable. Table IV. gives details of the treatment which the nine patients had undergone. The length of time over which injections were given, the total amount of lead administered (as the electrically-prepared colloid S_7) and the period which had elapsed between the last injection and the operation or death after which the tissues were obtained, are the most significant factors determining the amount of lead likely to be found. (Tables III. and IV.)

TABLE IV.

Case No.	Age and sex.	Body weight in lbs.	Nature of growth.	Situation of primary.	Situation of secondaries.	Period in days during which injections were given.	Time in days since last injection.	Total of lead injected (g.).	Operation, post-mortem or delivery.
1	46 F	?	Carc.	Breast.	Liver.	91	9	0·325	Pm.
2	55 F	120	Carc.	Post cric.	—	150	9	0·375	Pm.
3	14 F	?	Sarc.	Bone of leg.	—	7	23	0·14	Op.
4	37 M	132	Sarc.	Leg.	Bones of leg.	126	36	0·70	Op.
5	37 F	134	Carc.	Rectum.	—	97	40	0·425	Deliv.
6	42 M	130	Sarc.	R.-peri.	Liver and perit.	217	44	0·600	Pm.
7	44 M	126	Sarc.	Thigh.	—	67	48	0·45	Op.
8	40 M	142	Sarc.	Perios.	—	189	84	0·52	Op.
9	38 F	98	Sarc.	R.-peri.	—	430	307	0·775	Pm.

R.-peri. = retroperitoneal Perios. = periosteal.
Perit. = peritoneum.

Summary.

While there are not sufficient data to make extended discussion worth while, certain features of interest may be mentioned.

In Case 1 the secondary carcinoma of the liver contained four times as much lead as the liver tissue in the neighbourhood, although this last material contained areas of growth. The primary breast carcinoma contained more lead than any normal tissue except the kidney. (The value for the fibroid seems improbably high.) In Case 8 the periosteal sarcoma contained more lead than the adjacent normal bone. Thus we have some evidence that lead is particularly attracted to malignant tissue though against these two cases must be set Case 6, where the sarcoma contains less lead than the normal tissues. It will be noticed that in this patient the liver also contained only a small quantity of lead.

For obvious reasons, tumours in which retrogression had occurred have not been analysed; consequently the clinical results cannot be correlated with the lead-content of the tumours in this investigation. The normal tissues contain variable amounts of lead, and cannot be arranged in any definite order for lead-content. It is significant that very little lead is present in the tissues of Case 9, where nine months had elapsed since lead was last injected, although the patient was supposed to have died from lead poisoning. The remaining cases had all had lead within three months. The suggestion is that very little of the lead injected is permanently stored. The bones do not appear to retain much lead, although Aub *et al* [1] regard them as the chief site of storage. The analytical method used is perhaps least satisfactory for estimating lead in bones.

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Clinical and Laboratory Notes.

A CASE OF URÆMIA SIMULATING ACUTE INTESTINAL OBSTRUCTION.

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The following case has interesting features :—

An unmarried woman, aged 53, was admitted to Addenbrooke's Hospital in March, 1928. The history was that in the previous autumn she had an attack of abdominal pain and vomiting which cleared up after a few days. For several weeks before admission she had become increasingly constipated, and for five days her bowels had not been opened at all. On the second day of complete constipation she began to vomit, and this symptom increased in severity until she could keep nothing down. As far as could be ascertained during this five days she passed no flatus. Urine was passed regularly in apparently normal amount. There was nothing in her past history to suggest renal disease.

On admission she complained of a severe headache and was vomiting every few minutes. On examination the abdomen was distended, especially in the left iliac fossa, and there was some tenderness in this region but no rigidity. The bladder was greatly enlarged and on catheterisation after micturition yielded 17 oz. of urine. There was no visible peristalsis, and nothing could be felt on rectal examination. The pulse was 100 and dehydration from excessive vomiting was severe. The urine had a specific gravity of 1018 and contained a moderate cloud of albumin but no blood, pus, or casts. During the next twelve hours the pulse-rate rose to 120 and the vomit developed a fæcal odour.

Two enemata failed to give any result, and on my assumption that there was an obstruction of the pelvic colon, Mr. V. C. Pennell performed a laparotomy. The whole of the colon was found to be distended with hard fæces, but there was no organic obstruction of any kind. The uterus was retroverted and appeared to be pressing on the neck of the bladder so as to obstruct the outflow of urine. It was therefore replaced in the anteverted position and the abdomen was closed.

The day after operation the blood-urea was estimated and found to be 258 mg. per 100 c.cm. After operation catheterisation was done every six hours and the bowels were eventually opened by means of repeated enemata combined with injections of pituitrin. The vomiting ceased in 48 hours and the patient's condition improved steadily. The necessity for catheterisation gradually became less and at the end of three weeks there was no residual urine after normal micturition, so it was discontinued. The constipation also grew less and the bowels opened regularly with the assistance of salts and aloes. The patient felt very nearly well, was eating with appetite, and getting up. The urine was of normal specific gravity, and contained only an occasional faint trace of albumin and no other abnormalities. The blood-urea was 28 mg. per 100 c.cm. The patient recovered and was well six months after discharge from hospital.

This case, apart from its diagnostic interest, well illustrates the profound effects of urinary retention on the kidney. This factor is only too well recognised by surgeons who, in cases of enlarged prostate with urinary retention, only perform the major operation after preliminary drainage of the bladder, thereby allowing time for the kidney to excrete toxins and waste products which have been dammed back in the blood.

In this instance retention was first caused by the combined effect of fæcal accumulation in the pelvis and the retroverted uterus pressing on the neck of the bladder. The toxæmia from profound constipation probably played its part by lowering the muscular efficiency of the bladder so that it could not overcome the obstruction. Once this occurred secretion by the kidney was seriously interfered with, as was shown by the uræmic state and the high blood-urea. The fact that the urine was normal but for some albumin suggests that this was a pure pressure effect and was not due to an associated nephritis. The rapid

clinical improvement and fall of blood-urea to normal during regular catheterisation was very striking.

I am indebted to Dr. E. P. H. Dudley of Caxton for the early history of this case.

A CASE OF CHRONIC MENTAL DISEASE ASSOCIATED WITH OVARIAN DYSFUNCTION.

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WITHIN recent years a considerable amount of attention has been directed to the organic factor in the ætiology of mental disease, and in this connexion the following case seems worthy of record:—

The patient, aged 32, had been married four years and had no living children (she had had one stillbirth and a miscarriage at six months). She was admitted to a maternity hospital in June, 1921, suffering from ante-partum hæmorrhage and albuminuria. Placenta prævia was diagnosed, an internal version performed, and a 28-weeks' fœtus delivered. After delivery there was an intermittent temperature, and on the ninth day of the puerperium she became restless and confused, and as acute mania supervened she was transferred to a mental hospital. There was then evidence of puerperal infection, which subsided after a fortnight's treatment. Mentally she was described as confused, restless, and hallucinated, and at times excited. She remained like this for four years, and on Sept. 18th, 1925, she was transferred, as a case of chronic confusional insanity, to Rubery Mental Hospital, under the care of Dr. T. C. Graves, who has kindly placed these notes at our disposal. She was then in fair health, pale, and rather obese. Her facial appearance was striking: the features were coarse, resembling the acromegalic facies sometimes seen in pregnancy. Her menstrual cycle was irregular $\left(\frac{1-16}{14-63}\right)$, sometimes scanty, and at other times profuse. The Wassermann reaction of the blood and examination of the urine were negative. A gynæcological examination disclosed a lacerated and infected cervix, associated with a subinvoluted uterus. The right ovary was prolapsed, enlarged, and tender. The infection of the cervix cleared up with local treatment. Endocrine and non-specific protein therapy were tried for definite periods, and injections of collosol calcium were also given. An ear and throat examination by Mr. W. S. Adams showed that both tonsils were hypertrophic, and the right membrana tympani was retracted. He removed both tonsils by blunt dissection on Oct. 31st, 1926, and also performed a general sinus examination and drained the left antrum on April 24th, 1927. An encapsuled abscess was discovered in the right tonsil, and the antrum was found to contain muco-pus. There was a relative improvement in the mental condition after each of these operations, especially after the second, when she became less confused and quieter. It was noted, however, that during the whole of the period, and also for three or four days before and after the menstrual flow, she relapsed to her former confused faulty and restive state. She passed the summer of 1927 oscillating between two states. At times she was deeply confused, faulty, resistive, and impulsively violent, having to be nursed in a single room in strong clothing and on a straw mattress. At other times she would dress neatly, mix in a friendly way with the other patients in the general ward, and could actually be allowed out for a few hours with her husband. The change from one state to the other was in direct relation to the phases of the menstrual cycle.

On Sept. 29th, 1927, a pelvic examination under general anæsthesia showed evidence of chronic inflammatory changes of the adnexa associated with a subinvoluted uterus. A diagnostic curettage was performed at the same time; the endometrium was much thickened, and histologically there was considerable hyperplasia of the uterine glands, although it was in the intermenstrual phase. As there was no material mental or physical improvement after this operation a laparotomy was performed by one of us (A. D.) on Feb. 11th, 1928, during the usual intermenstrual remission of symptoms. The operation disclosed definite evidence of long-standing pelvic inflammation; there were many adhesions, both Fallopian tubes were thickened, the ovaries were cystic, and the uterus was subinvoluted. A right salpingo-oöphorectomy was performed; the left tube was conserved, but the cystic portion of the left ovary was resected. The abdominal wall was closed with especial care, and the wound healed by first intention. The convalescence was uneventful. There was slight menstrual loss ten days after operation, a three-day period in March, no loss in April, and a four-day period in May. The conduct became exemplary, and the mental state appeared to be absolutely unaffected by the menstrual cycle. At an interview on May 5th, 1928, the patient was quiet, pleasant, and amenable; she was well orientated, and took an intelligent interest in her surroundings. Her memory was poor for events before her last operation, but she could clearly remember everything after that. She realised that she had been ill, and stated that she now felt a new woman. She ate and slept well. Her complexion was pink and healthy, and in marked contrast with her former thick and coarse appearance. On May 10th she was discharged to the care of her husband after six years and eleven months in a mental hospital, and up to date (Jan. 11th, 1929) there has been no return of her mental symptoms.

Pathological Report.—Right ovary enlarged to one and a half times normal size. Tunica much thickened and surface lobulated and studded with numerous distended follicles of various sizes. Macroscopically a fibro-cystic type of ovary. Sections from the ovary showed the vessels very sclerosed; cystic spaces were present, some of which contained poorly developed lutein tissue of an aberrant type.

Comment.

The outstanding feature of this case was the remarkable exacerbations of mental symptoms at a particular phase of the menstrual cycle, and their complete remission after resection of the diseased part of the ovaries. The irregularity of the menstrual process in interval, duration, and amount was a clear manifestation of disordered ovarian function; the pathological findings were in accord with this. In view of the recent work on "œstrin," and the apparent physiological antagonism between the œstrus-producing hormone and that of the corpus luteum, it seems reasonable to infer that the morbid condition of the ovaries had interfered with the normal correlation of their cyclic functions. Presumably this derangement had thrown out of gear the endocrine balance which, in this instance, had caused a psycho-pathological reaction.

Although this observation must be hypothetical, the result is arresting. It is recorded in the hope that it may stimulate further investigation into this subject.

BLOOD-SUGAR ESTIMATIONS IN THE TREATMENT OF DIABETIC COMA.

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Diabetes mellitus sometimes presents unusual features in childhood. We have observed a diabetic child who had a blood-sugar of about 40 mg. per cent. over a period of a few weeks without any adverse signs or symptoms, and we believe that this may not be very unusual in children. It may cause great difficulty in the treatment of diabetic coma as the following case illustrates.

A girl of 13 was admitted to the Queen's Hospital, Birmingham, at 9.30 P.M. on Feb. 17th, 1927, in a state of semi-coma, for diagnosis and treatment. The parents related that the girl had been perfectly well until one week before admission, when she had complained of a shivering attack and stayed in bed for three days. After she had been up again for a few hours vomiting had necessitated a return to bed. It had recurred frequently next day, and headache and great thirst with complete anorexia had supervened. During the last few weeks there had also been considerable loss in weight. There was nothing of clinical value in the family history, and no previous illnesses of any consequence.

Her condition on admission was one of drowsiness with marked air-hunger, dry skin, subnormal temperature (95° F.), a pulse-rate of 120, and a dry throat. The deep reflexes were absent and the plantar response was flexor. The fundi were normal, but ocular tension was markedly diminished.

There was a marked odour of acetone. A large distended bladder was emptied spontaneously soon after admission. There were no detectable signs of sepsis anywhere. Urine examination revealed 6 per cent. of sugar (Fehling's method),

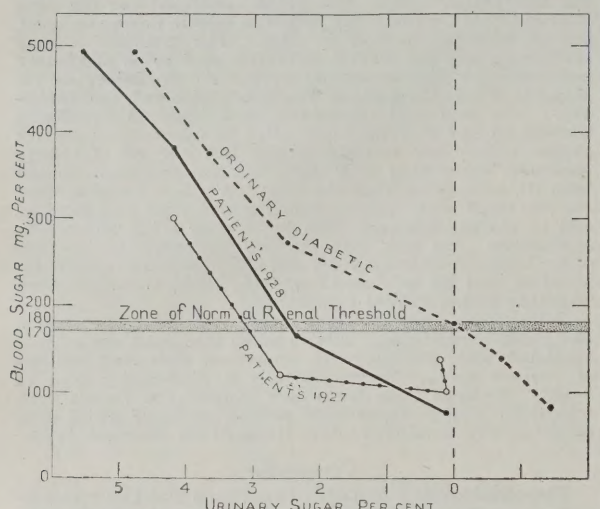

Chart to illustrate the relationship of blood-sugar to glycosuria in the patient (1927 and 1928) and in a diabetic with normal renal threshold.

a haze of albumin, and strongly positive tests for acetone and diacetic acid.

A diagnosis of diabetic coma was made and treatment was given as shown in the following table.

Table showing Treatment and Progress after Admission.

Date: Feb., 1927.	Time.	Blood-sugar mg. per cent.	Urine-sugar per cent.	Treatment.
				Period A.
17th	10.30 P.M.	—	6·0	Cal. gr. iii., sod. bicarb. gr. xv., 4-hourly. 20 units insulin.
	11.30 „	—	—	20 „ „
18th	12.45 A.M.	—	4·2	20 „ „
	1.45 „	—	—	20 „ „
	3.0 „	—	3·7	20 „ „
				Enema given.
	5.30 „	—	—	10 units insulin.
	6.30 „	—	—	10 „ „
	8.15 „	—	2·0	20 „ „
	9.15 „	—	1·8	10 „ „
				Period B.
	10. 0 „	13	—	100 c.cm. 20 per. cent. gluc. int. 1 c.cm. of adrenalin. Gluc. and sod. bicarb. per rectum.
	11.30 „	19	—	100 c.cm., 20 per cent. glu. int.
	12.30 P.M.	89	—	—
	4. 0 „	25	—	1 c.cm. adrenalin.
	4.30 „	—	—	100 c.cm. 20 per cent. glu. int.
	6. 0 „	—	—	100 c.cm., 20 per cent. „ „
	10.30 „	25	—	300 c.cm., 20 per cent. „ subc.
				Period C.
	11.30 „	—	1·0	—
19th	3.30 A.M.	—	—	100 c.cm. gluc. subc.
	8.30 „	—	—	50 c.cm. „ by mouth.
	10. 0 „	283	3·8	—
	10.30 „	—	—	10 units insulin.
	12.30 P.M.	115	2·8	—
				Period D.
	3.30 „	—	—	50 c.cm. gluc. by mouth.
	6.15 „	—	—	2 oz. gluc. by mouth.
	11.30 „	72	2·7	2 „ „ sol. „ „
20th	8.30 A.M.	90	—	—

Gluc. int. = glucose intravenously. Subc. = subcutaneously.

During Period A the child was treated with insulin for diabetic coma—circumstances made it impossible to do blood-sugar estimations, but sugar was present in the urine. During Period B the patient was in a state of hypoglycæmia and collapse with quick feeble pulse, flushed face, and very shallow breathing. During Period C there was disappearance of the hypoglycæmic phenomena and consciousness was regained. Period D showed a marked improvement in general condition. It is to be noted that there was a rapid fall of blood-sugar following 10 units of insulin, yet glycosuria persisted.

After recovery from coma the patient was put on a diabetic diet of over 1000 calories; she passed from 6 per cent. to 8 per cent. of sugar daily, and this was readily controlled by 5–10 units of insulin in the 24 hours.

Further Investigations.

Blood count: leucocytes, 14,000; red cells, 4,500,000; colour-index, 0·8; no abnormal features in films. Blood pressure: 100/65. The blood contained 36 mg. of urea per cent., 2 mg. of uric acid per cent., and 1·2 mg. per cent. of creatinine.

The knee- and ankle-jerks returned, but remained diminished. X ray examination of the cranial sinuses, lungs, &c., showed no abnormality.

Glucose-tolerance Test.

		mg. per cent.	
Blood	9.20 A.M.	286	Before 50 g. glucose.
	10 A.M.	400	After 50 g. glucose.
	10.40 A.M.	465	
	11.20 A.M.	385	
	12.30 P.M.	330	

		Quantity.	Sugar (g.) per cent.
Urine	8.45 A.M.	145 c.cm.	7·46
	10 A.M.	110 c.cm.	6·86
	11 A.M.	125 c.cm.	9·8
	12 noon	90 c.cm.	9·8
	1 P.M.	45 c.cm.	8·4

Investigation of Renal Threshold.

April, 1927.	Blood-sugar.	Urine-sugar.
6th	303 mg. per cent.	4·2 per cent.
11th	118 „ „	2·6 „
19th	102 „ „	Trace.
29th	154 „ „	0·14 per cent.

After another attack of coma in July, 1928, the investigation of the renal threshold on August 14th showed:—

	Blood-sugar.	Urine-sugar.
10.25 A.M.	488 mg. per cent.	5·5 per cent.
11.25 A.M.	385 „ „	4·1 „
12.30 P.M.	169 „ „	2·3 „
1.10 P.M.	75 „ „	Trace.

Her condition was then very little changed since her previous admission, and 20 to 30 units of insulin were required daily to control the sugar excretion on a diet of sufficient calorific value to maintain her general health.

Summary.

1. On admission the child's urine contained 6 per cent. of sugar. She was treated with 140 units of insulin (in 20-unit doses), and as the urine still contained 1·8 per cent. of sugar a further 10 units of insulin were given. During the period it was not possible to obtain blood-sugar estimations, but one hour after the last dose of insulin the blood-sugar was 13 mg. per cent. Clinically the child had passed from hyper- to hypo-glycæmia, but still retained the glycosuria. 2. It was manifest that the renal threshold had been completely disorganised and, for the time being, the kidneys were allowing sugar to escape despite a subnormal blood-sugar. This rendered it essential that further treatment should be controlled by frequent blood-sugar estimations. 3. After the state of coma had been overcome a great susceptibility to insulin occurred, as shown by the reduction of the blood-sugar from 283 mg. per cent. to 115 mg. per cent. with 10 units of insulin, the urinary sugar falling from 3·8 per cent. to 2·0 per cent. at the same time. This further illustrated the value of blood-sugar estimations. 4. Large doses of glucose were required to raise the blood-sugar to normal limits, apparently because of the extreme degree of renal leakage and prolonged effect of insulin. 5. Four weeks after admission the renal threshold for glucose had improved, but had not become normal. 6. A recent re-examination shows the persistence of the abnormal renal threshold.

We are indebted to Dr. J. G. Emanuel and Dr. L. G. J. Mackey for allowing us to investigate and report this case.

LONDON HOMŒOPATHIC HOSPITAL.—This institution, in Great Ormond-street, W., has just received a Charter of Incorporation. The hospital was founded in 1849, and since the present building was opened in 1895 it has more than once been enlarged.

Medical Societies.

HUNTERIAN SOCIETY.

AT a meeting of this Society, held at the Mansion House on Jan. 14th, the chair was taken by the President, Dr. ARTHUR WESTERMAN, and a Hunterian lecture on

INTRATHORACIC SURGERY

was delivered by Prof. J. H. ZAAIJER, of the University of Leyden. He described the work of himself and his colleagues since 1909 on the surgery of the œsophagus and lungs. He said he had felt that positive and negative pressure anæsthetic apparatus was essential, but that the elaborate American apparatus for this purpose was unnecessary. He described the simple apparatus used in Leyden and the device used to apply the mask to the face in any position of the patient. Positive pressure anæsthesia was necessary as a precaution in unilateral as well as in bilateral pneumothorax. It was also valuable in preventing air-embolism, as illustrated by a case of a large lymphogranuloma on the front of the neck which had an extensive venous anastomosis with the chest wall. Nitrous oxide oxygen ether anæsthesia had proved very satisfactory for these cases. Experiments on animals had convinced him that it should be possible to perform an intrathoracic resection of the œsophagus in man. A young woman with a benign stricture had consulted him, as she was really starving. Gastrostomy had been performed, but the stricture could not be penetrated and a large putrefying mass had remained in the enormously dilated œsophagus. He had therefore removed a number of ribs on the left side, isolated the œsophagus, and sutured it to the thoracic wall. Twelve days later he had opened the œsophagus, making a thoracic œsophagostomy. The patient had fed herself by means of a glass bottle and bellows concealed under her clothing. The food taken into the mouth passed through the œsophagostomy into the bottle by rubber tubing, which she closed with a pressure-screw when the bottle was full. Compression of the bellows then forced the food into another tube which led it through the gastrostomy opening into the stomach. This experience had shown that the human œsophagus could be isolated from its bed for a considerable distance without undergoing necrosis, and this opened the way to treatment of low œsophageal carcinoma. The next cancer case had been treated in three stages—gastrostomy, extensive rib resection, and removal of the tumour. The œsophagus had been sutured to the mobilised chest wall and the patient had lived for three and a half months, thus proving the technical operability of carcinoma of the cardia and lower end of the œsophagus. Other surgeons had performed the operation with cure lasting for many years. In Prof. Zaaijer's opinion it was worth while continuing efforts to treat this condition by operation. He had tried several ways, but remained convinced that his own method was the safest.

Cardiospasm.

However slight the direct results of this work might have been as yet, the indirect results had already been far reaching. The commonest form of cardiospasm occurred in patients with marked abdominal ptosis, and there was always a long abdominal portion of the œsophagus with a thin circular musculature. The dilated part, above the diaphragm, had thickened musculature. He had therefore concluded that the rest-position of the subdiaphragmatic piece of the œsophagus was closure, its function being to open at the required moment. The opening muscles were the longitudinal ones, and these would be in a bad condition for work in the ptotic œsophagus. The function of the supradiaphragmatic part of the œsophagus was to push food on; if it found the cardia closed, the result became a matter of balance; so long as the force of the upper part could overcome the resistance of the cardia there would be no symptoms. When, however, dilatation succeeded to hypertrophy "cardiospasm" developed. It was a curious fact that a thick sound could always be passed through a cardiospastic œsophagus, thus suggesting strongly that the condition was not a "spastic" one. He had had success with Heller's method of splitting the circular muscle bundles, and had found that the dilatation was reduced. Influenced, however, by his theory of the origin of the condition, he had tried treatment by rest of the œsophagus—i.e., feeding for several weeks through a tube and washing out the œsophagus with salicylic or boric acid solution. This had proved very successful.

Another variety of cardiospasm might result from an excessive amount of air in the stomach. One patient had been benefited by a gastrostomy to let out the air, and had been finally enabled to return to her work by an apparatus to suck air out through the gastrostomy, to be dispersed over her shoulder. In the Middle Ages a woman like this would certainly have failed to pass the "sinking-test" for witches, as the air in her stomach would have made her float.

Organic Strictures.

Prof. Zaaijer showed slides illustrating a number of cases of organic stricture of the œsophagus treated by the usual dilating methods. He pointed out the advantage of using a thin rubber tube threaded with a silk or cotton thread. The patient would bite through an empty tube, and the thread alone would cause a cutting sensation in his throat. One patient, a man of 49, had been treated by gastrostomy and jejunostomy for gastric ulcer 14 years before. He had later experienced difficulty in swallowing, had been diagnosed as œsophageal carcinoma, and pensioned with a gastrostomy as a hopeless case. His œsophagus had been dilated by Prof. Zaaijer in the usual way and cured completely, but unfortunately he had been unable to obtain work, as he had been officially declared "incurable." For higher stricture an antethoracic œsophagus might be made by suturing a loop of small intestine to the stomach and the skin and making a skin tube above it. One patient successfully treated in this way at Leyden 11 years ago was still taking his food normally with his fellow-servants in the hospital.

Bronchiectasis.

The treatment of bronchiectasis had been carefully worked out in the Leyden clinic and a series of well-marked stages had been defined. Lobectomy was no longer a dangerous operation, and was almost a certain cure. French operators seemed satisfied with avulsion of the phrenic nerve, but in Holland, as in England, the results had not been very good. Thoracoplasty was the second stage, but it must be done so as to interfere as little as possible with the function of the healthy parts of the organ. The methods of Sauerbruch, Brauer, and Wilms damaged the upper lobes seriously and were therefore undesirable. Extended resection of the ribs over the affected lobe was a useful procedure, but must include removal of the periosteum with the intercostal muscles. This removal also lessened the shock of the operation. For one thing it saved the shock-effects of absorbing bruised muscle tissue; secondly, if the thoracoplasty failed, the subsequent intrathoracic operation became a soft-tissue manœuvre, and so was greatly facilitated; thirdly, the removal of periosteum and muscles caused adhesion of the underlying lung. The next stage was extirpation of the lobe or slow destruction of it by Graham's method. The latter involved grave danger of air-embolism and hæmorrhage. Resection in the usual way caused shock and risk of broncho-fistula. The third stage at Leyden had therefore taken the form of intrapleural plugging of the pleura after freeing the affected lobe from its adhesions as far as possible. This gave complete and permanent cure by

compressing the diseased lobe with a minimum of danger and without complications. Even, however, if the lobe were too indurated to be compressed, the final stage of lobectomy—once so feared—was not really much more serious. When the plugs were removed the lobe was found as a more or less pedicled structure in the closed pleural cavity around it, and it could be removed by slow elastic stricture of its root. This could be done in the ward without pain or shock, the elastic tube being tightened daily until the lobe necrosed and fell off—usually in about two weeks' time. The cavity was then loosely plugged with gauze and became smaller and smaller until it closed. Prof. Zaaijer showed photographs and radiograms of a number of cases, demonstrating that the patients recovered completely, with almost normal use of the arm and normal function of the remaining lobe of the lung.

The PRESIDENT recalled the visit of the Dutch admiral who had sailed up the Thames with a broom at his masthead, and the English admiral who had retorted by fastening a whip to his. Prof. Zaaijer, he said, had brought both broom and whip, sweeping away many old notions of the dangers of intra-thoracic surgery and stimulating thought. Meetings such as this performed an international service in preserving the friendship and increasing the mutual respect of two nations.

Mr. J. E. H. ROBERTS, proposing a vote of thanks, remarked that a great deal of work on the surgery of the œsophagus had been done in the north-west corner of Europe without being heard of in this country. The knowledge that surgeons could deal with bronchiectasis was not adequately spread throughout the profession, and therefore surgeons did not see cases in the early, basal, unilateral stage, but only when the condition had become diffused.

Sir JAMES DUNDAS-GRANT, seconding the vote, said that Prof. Zaaijer's demonstration had been extraordinarily convincing, and mentioned the use of radium, to the possibilities of which surgeons must not shut their eyes.

DONATIONS AND BEQUESTS.—Mrs. Jane Parton, of Percy House, Tunbridge Wells, left £22,500 for charity, including £2000 each to the Royal Blind Pension Society, Dr. Barnardo's Homes, and the General Hospital, Maidstone; £1000 each to the Cancer Hospital, Brompton, the Royal Hospital for Incurables, Putney, and the General Hospital, Tunbridge Wells; £500 each to the Convalescent Home for Children, Hawkenbury, Tunbridge Wells, and Dr. Barnardo's Cripples' Home, Tunbridge Wells.—Dr. John Cornwell Round, of Purbrook, Sydenham, left over £15,000 upon trust for two persons and on the decease of the survivor with remainder equally between the Royal National Life-boat Institution and the Samaritan Fund of St. Thomas's Hospital.—Lady James, of Springfort, Stoke Bishop, Bristol, left £750 to Bristol General Hospital and £250 to Bristol Blind Asylum.—Sir George Sheppard Murray, of Cleveland House, St. James's-square, and Barretstown Castle, Co. Kildare, left £1000 each to the Imperial Cancer Research Fund, the National Association for the Prevention of Consumption or Other Forms of Tuberculosis, and Dr. Barnardo's Homes, as an addition to capital, and £500 to Poplar Hospital for Accidents.—Mr. Edmund Murray Dalgety, of Magdalen Yard-road, Dundee, left £2800 to such Dundee charitable institution or institutions as the trustees may select; £1000 each to the Dundee Royal Infirmary and the Royal Victoria Hospital, Dundee; and £200 to the Little Sisters of the Poor, Wellburn, Lochee.—Mr. Edwin William Goodwin, of Didsbury, Manchester, left £500 each to Manchester Royal Infirmary, Ancoats Hospital, the Boys' and Girls' Refuges and Homes, St. Dunstan's Hospital for Blind Soldiers and Sailors, Manchester and Salford, the Royal Schools for the Deaf and Dumb, Old Trafford, Manchester, the Crippled Children's Help Society, and St. Mary's Hospitals, Oxford-road, Manchester.—Mr. Frederick William Archer, of Lansdowne-place, Hove, left £1000 to the Leicester Royal Infirmary, £500 to the Leicester Guild of the Crippled, £200 each to the Leicester Infirmary for the Blind, £100 each to the Leicester Wycliffe Society for the Blind and the Leicester Children's Hospital.—Lord Glendyne has made a donation of £1000 towards the £35,000 required by the Royal Northern Hospital, Holloway, in order to obtain an anonymous gift of an equal sum.

Reviews and Notices of Books.

ARTHRITIS.

Chronic (non-tuberculous) Arthritis. By A. G. TIMBRELL FISHER, *M.C.*, F.R.C.S. Eng., late Hunterian Professor, Royal College of Surgeons of England; Surgeon to the Seamen's Hospital. London: H. K. Lewis and Co., Ltd. 1929. Pp. 232. 25*s*.

PROBABLY what is commonly known as rheumatic arthritis causes in this country as much or more suffering and disability than all other chronic diseases put together. Recognising this fact and realising that there is much still to be learnt about the physiology of joints and the pathology and ætiology of chronic arthritis, Mr. Timbrell Fisher undertook the investigations which are described in this book. Although gouty arthritis and joint diseases associated with chronic affections of the central nervous system are included, the really important subjects of this work are the two conditions which are described as rheumatoid arthritis and osteo-arthritis. The author first discusses the physiology and histology of the parts forming normal joints and then proceeds to describe a number of experiments and investigations designed to advance our knowledge of the pathology of both forms of chronic joint disease and of their treatment. Probably in this country no surgeon has had a more widespread and enduring influence on the treatment of inflamed and painful joints than John Hilton of Guy's Hospital, whose lectures on rest and pain have been accepted by several generations of students and surgeons as a true gospel. Of late years it has been realised, however, that in certain cases rest is not the best treatment for a chronic inflamed joint. As Mr. Fisher points out, complete rest and cessation of function leads to atrophy of important joint elements, an atrophy comparable to the degeneration which is one of the characteristics of disease; whereas in many cases of chronic arthritis, movement favours cure and preserves function. The difficulty is that only experienced surgeons can decide in which cases to prescribe and insist on movement and in which to order complete rest, with or without the intention of procuring healing by ankylosis.

Mr. Fisher gives due importance to orthopædic measures of various kinds, but describes also the operations of arthrotomy, cheilotomy, synovectomy, excision, and arthrodesis, including his own method of approach to and exposure of the knee-joint. Rheumatism of joints is, however, as much in the domain of medicine as of surgery, and Mr. Fisher recognises medical treatment to be of the first importance.

This book is really interesting. New facts and original observations are introduced and some known facts are brought to notice in a new light and fresh inferences are drawn from them. All who have to do with cases of chronic joint disease of so-called rheumatic origin will find it worth while to study Mr. Fisher's views.

Les Arthrites Gonococciques. By HENRI MONDOR, Professeur agregé de la Faculté de Médecine de Paris; Chirurgien des Hôpitaux. Paris: Masson et Cie. 1928. Pp. 528. Fr.70.

THE arthritic manifestations of gonorrhœa were first recognised in France by Swediaur, in Berlin by Christian Theophilus Selle, and in Great Britain by John Hunter, Sir Benjamin Brodie, and the surgeon who in this book is called "Sir Astley Copper." It is probable that gonorrhœal arthritis is nowadays more prevalent in France than with us; but whether its incidence be frequent or relatively rare, its consequences are disabling and its course prolonged. A large and serious work upon this important subject is therefore welcome. Prof. Mondor protests against the use of the term rheumatism in this disease, which he rightly describes as an infectious arthritis, in its early

stages generally acute. He writes as a surgeon and is sceptical as to the value in gonococcal arthritis of medical treatment, such as serotherapy and vaccinotherapy or palliative measures. His conclusions are founded on a vast knowledge of the pathology of the disease; many pages are devoted to discussion of pathological anatomy, and Prof. Mondor illustrates his study with coloured microphotographs and other figures of considerable interest. In the clinical section the classification is elaborate, and presents the various forms and sites of disease under 14 headings. The scale of the work may be gauged by the fact that under the general heading of "Formes segmentaires" subsections deal separately with the disease as it is manifested in each segment of the patient's frame; for example, one is concerned solely with gonorrhœal feet, such as flat-foot, pseudo-gout, bony spikes and outgrowths, and "pied-cloué." Cytology, bacteriology, blood culture, serodiagnosis, vaccinodiagnosis, and fixation reactions of the disorder are treated in sections headed Laboratory Research. Much space is devoted to descriptions of cases and discussion of methods of treatment. At the outset the original focus of the disease in the genito-urinary system must receive early and thorough treatment, including necessarily the seminal vesicles in the male and the uterus and tubes in the female. For the rest, Prof. Mondor disposes politely but firmly of the arguments of those physicians who claim to have obtained results from serum and vaccine therapy. He has found no reliable evidence to justify such claims. Of the hyperbolical praise accorded to certain other methods he says: "cet amas d'adjectifs ne saurait cacher entièrement le visage de la réalité." In fact, the number of sovereign remedies advocated in the past may be taken as an index of the ill-success of treatment in too many refractory cases. Immobilisation, compression, mobilisation, massage, puncture, hyperæmia, electrotherapy, radium, auto-serotherapy, protein treatment, sero- and vaccino-therapy have also been vaunted. The author considers that of these only vaccinotherapy with puncture as a secondary measure are of much value and that surgical intervention, especially arthrotomy with immediate suture if used very early in the course of the disease, is the method of choice. His statistics seem to us to bear out his conclusions.

This work should be studied by all those who have to treat gonorrhœal arthritis. It contains a vast amount of information on the subject and abundant evidence is offered from which the reader may draw his own conclusions. The mass of facts included makes the book bulky, but it has no redundant passages, and compression would have diminished its value. There is a bibliography of 47 pages, but no index.

CARDIAC ARRHYTHMIAS.

By IRVING R. ROTH, M.D., Assistant in Medicine, Mount Sinai Hospital. New York: Paul B. Hoeber, Inc.; London: Humphrey Milford, Oxford University Press. Pp. 210. 36*s*.

TEN years ago there was a certain novelty about the cardiac arrhythmias which rendered them extremely fashionable for examination purposes and as subjects for post-graduate lectures. Now that novelty has worn off, and the well-informed practitioner has a pretty good idea of what is meant respectively by auricular fibrillation, sinus arrhythmia, and extrasystoles. He is unlikely to need a large tome on the subject, and his less enterprising colleagues, who do not trouble their heads about such matters, will certainly not read one. We do not therefore anticipate that there can be a big demand for such a work as this, for it is quite an elementary treatise and will not appeal to the specialist. Certain people, however, cannot digest condensed matter and prefer to take their mental nourishment in bulk. This work should appeal to them, for the text is clearly written and the diagrams are good, though in some cases unnecessarily elaborate. The printing and production generally are excellent.

WILLIAM HARVEY.

Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus. By WILLIAM HARVEY, M.D. With an English Translation and Annotations by CHAUNCEY D. LEAKE, Professor of Pharmacology, University of California. London: Baillière, Tindall and Cox. 1928. With five plates. Pp. xii.+228. 16*s*.

William Harvey. By ARCHIBALD MALLOCH, M.D., M.R.C.P., Librarian, New York Academy of Medicine. New York: Paul B. Hoeber, Inc. 1929. With ten plates. Pp. xii.+103.

THE Harvey Tercentenary was celebrated on the other side of the Atlantic as well as on this, and these two volumes are some of the tangible results. Prof. Chauncey D. Leake has produced an interesting and comprehensive memorial of Harvey's work in his book, which would probably have found a wider public had it come while interest in the subject was at its height. The first part of the work consists of a facsimile reprint of the first edition of "De Motu Cordis"; this includes the leaf of errata which was omitted from the facsimile issued by the Royal College of Physicians of London. The text was so inaccurately printed that this leaf is of some importance. The second part is a new translation of the treatise, which Prof. Leake believes to be "the third attempt to render Harvey's classic into current English idiom." Actually it is the fourth, but this fact in no way detracts from the value of Prof. Leake's rendering, no attempt having been made since 1847. In that year the Sydenham Society published Robert Willis's stilted and unattractive translation, and this has held the field ever since as the standard English text. The new text is a great improvement on the old. It is a sufficiently free translation to make easy reading, without departing from Harvey's intention, and for this reason the book should be welcomed in England and America. Prof. Leake has added numerous useful and interesting annotations in footnotes. His illustrations increase the value of the book, though his reproduction of Harvey's diagrams of the venous circulation in the forearm is hardly adequate.

Dr. Archibald Malloch's smaller book, based on a tercentenary address delivered in Boston, provides an admirable companion volume to the new translation. In small compass he includes a study of Harvey's life and doctrines, in which all the important facts are attractively presented. It is difficult at the present day to discover any new facts connected with Harvey, but Dr. Malloch, at any rate, contributes the observation that, in spite of his name, Wilhelm Fitzer, Harvey's first publisher, was probably an Englishman, who published also works by Robert Fludd and De Bry's "Voyages." We thus come nearer to an explanation of why Harvey chose Frankfort as his place of publication. Dr. Malloch was also responsible for the very useful Catalogue [1] of a Harvey Exhibition held at the New York Academy of Medicine.

INCOMPATIBILITY IN PRESCRIPTIONS.

By SANTOSH KUMAR MUKHERJI, M.B. Calcutta: Rai Saheb B. N. Mukherji and Son. 1928. Pp. 135.

THE excellent intentions of this book are not quite borne out in the result. Possibly a less ambitious treatment of the subject would have saved the author from committing himself to such singularities as the statements that calcium hydroxide is insoluble in water, and that syrup of squill cannot be given with alkalis. Repetition is surely not inevitable in a volume of this size. For example, we read on pages 41, 43 and 45 the statement that sodium bicarbonate is given in combination with diluted hydrocyanic acid. Prolixity, however, is not so serious a fault as inexactitude. Compression under expert advice may produce a revised edition that can be welcomed.

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[1] Bulletin of the New York Academy of Medicine, 1928, iv., 906.

EPIDEMIC ENCEPHALITIS WITH PREGNANCY, LABOUR, AND THE PUERPERIUM.

By FREDERICK ROQUES, M.A., M.D., M.Chir. Cantab., F.R.C.S. Eng. Manchester: Sherrat and Hughes. 1929. With two appendices. Pp. 139. 15*s*.

SINCE 1917 when in the *Wien. Klin. Wochenschrift* von Economo first described encephalitis lethargica, the literature on this disease has been extensive. It is, however, a curious fact that but little has been written upon it, when complicated by pregnancy, labour, and the puerperium; as far as we know this is the first book that has been published on the subject in any language, an omission doubtless due in the main to the fact that the complication is admittedly uncommon. Nevertheless it was quite time that the omission should be remedied, and Mr. Roques, towards this end, has dealt with the material at his disposal most thoroughly. Starting with chapters on its ætiology and pathology and on the clinical manifestations of epidemic encephalitis in the pregnant woman, the next four chapters deal with the influence of pregnancy on acute epidemic encephalitis and the influence of this disease on pregnancy, labour, and the puerperium. Two chapters on the child are succeeded by two on diagnosis and treatment, the last four chapters dealing with pregnancy and Parkinsonism. The records are given of 40 cases, which have not been published before, placed at the disposal of the author by colleagues, but in order to make his survey more comprehensive, the author has collected from such literature as was available 171 cases in which pregnancy was complicated by acute lethargic encephalitis besides and 23 cases in which pregnancy was associated with the Parkinsonian syndrome.

From a consideration of the material at his disposal, the author concludes that in the majority of cases pregnancy generally proceeds to term without any interruption, that in cases of greater severity premature labour often supervenes, while in the worst cases the patient dies before delivery. Labour differs in that it is painless, and the puerperium is not affected. Other interesting points are, for instance, that neither the age nor the parity of the pregnant woman increases the chance of infection, the mortality is greater when the infection occurs early in pregnancy, and that probably primigravidæ are more frequently attacked than multiparæ. The treatment of the complication is discussed fully and the author is of the opinion that the artificial termination of pregnancy is not indicated, that the second stage of labour should be completed as soon as possible with the aid of the forceps if necessary, and that the mother should not nurse her child. He also issues a warning that the onset of labour should be very carefully watched since, because of its painless nature, the child may be lost. His conclusions on pregnancy and Parkinsonism are that if the onset of Parkinsonism coincides with the onset of pregnancy, labour should be induced. Appendix I. contains full notes of the author's 40 cases, and Appendix II. a list of the cases previously published in medical literature, as regards their age, parity, stage of gestation, and results to the mother and child. There is a full bibliography consisting of 119 references.

Mr. Roques is to be congratulated on rendering a real service to obstetric medicine.

GOULD'S MEDICAL DICTIONARY.

By GEORGE M. GOULD, A.M., M.D. Second edition, revised and enlarged, by R. J. E. SCOTT, M.A., B.C.L., M.D., Fellow of the New York Academy of Medicine. With illustrations and 170 tables. London: H. K. Lewis and Co., Ltd. 1928. Pp. 1522. 30*s*.

THIS book now contains over 83,000 defined words, many hundreds of which are new, and its size exceeds that of the first edition by 125 pages. Dr. Scott states that "the present issue may be said to be the sum of all of Gould's Dictionaries." The parent volume, which appeared in 1894 and was entitled "An Illustrated Dictionary of Medicine, Biology and Allied Sciences," has been familiar for 30 years to all who value precision in medical and scientific nomenclature. A new feature is the inclusion of portraits of medical men who have given their names to operations or tests—a growing practice. This lays the burden on the lexicographer of noting the date of their death, and the fact has been overlooked that Henry Charlton Bastian died in 1915, George Huntington in 1916, Sir William Crookes in 1919, and Vladimir Bechterew on Christmas Day, 1927; while Dupuytren was born not in 1778, but on Oct. 6th, 1777. The eponym of Wilson's disease is misspelt. Help is given in the pronunciation of these proper names: Gould would allow us to call Blaud "blawd," and Glauber "glowber," but Angstrom is to be read "awngstrēm," which we regard as a hardship. While the dictionary is not free from trifling inaccuracies, it contains a wealth of accurate information, admirably displayed, which should make it as popular in its revised form as it was in the old.

THE SACK-'EM-UP MEN.

By JAMES MOORES BALL, M.D., LL.D. London and Edinburgh: Oliver and Boyd. 1928. Pp. 216. 16*s*.

THE author of this book is an ophthalmic surgeon of St. Louis, whose text-book, entitled "Modern Ophthalmology," is popular in other countries besides his own. The historical bent of his mind has already been shown in his monograph on "Andreas Vesalius the Reformer of Anatomy"; under a rather lurid title he now gives a good account, drawn from many sources, of the doings of the body-snatchers or resurrectionists—"its very hard them kind of men won't let a body be." The book is far from being a mere compilation of extracts from the works of others; it contains an excellent epitome of the history of anatomy and the provisions for its teaching in Europe and the United States. As is well known, the legal provisions for anatomical teaching in this country, before 1832, were meagre in the extreme. Even so late as 1830 the founder of one of the last of the private schools of anatomy in England wrote of the difficulties of procuring subjects and the personal risk attached to the office of a teacher of anatomy. Teachers on the Continent were better off in these respects. Naturally much space is devoted to the West-Port murders in Edinburgh a hundred years ago, and to the murder of an Italian boy, in London, by Bishop and Williams, in 1831. Of course Burke and Hare and Bishop and Williams were not "resurrectionists" in the proper sense of the word, but their ghastly trade was made possible by the apathy of the Government in the matter of making proper provision for the teaching of anatomy in this country, and no book on the subject would be complete that did not include a full account of these murders. Warburton's Anatomy Act of 1832, which put an end to body-snatching and to "murder as a fine art," is given in full. The book ends with a short chapter on the teaching of anatomy in America and the New York anatomy riots, and alludes briefly to certain cases of body-snatching which have been perpetrated in the States within comparatively recent times. It is obvious that when describing events which took place at so recent a date (only 50 years ago), the author has to be guarded in his statements; the time is not ripe for a complete review of the circumstances, but it is satisfactory to learn that the officials of the medical college that received the body were exonerated from all responsibility.

A special feature of this book is the wealth of illustrations; the plates are well chosen and excellently reproduced. Some rare handbills, and the title pages of some of the chap-books that flooded Edinburgh

at the time of the Burke and Hare murders, are included in the text and add greatly to its interest and value.

HEINE, THE STRANGE GUEST.

By HENRY BAERLEIN. London: Geoffrey Bles. 1928. Pp. 310. 12s. 6d.

Mr. Henry Baerlein's title has its origin in Matthew Arnold's lines:—

> The spirit of the world
> . . . let a sardonic smile
> For one short moment wander o'er his lips.
> That smile was Heine!—for its earthly hour
> The strange guest sparkled . . . ;

and certainly Heine's life, literary, mental, and spiritual, did make of him a strange guest on earth. We have in this book a discursive story of him, from the cradle to the grave. Born at Dusseldorf in 1797, of Jewish parents, he became more French than many French of the period, through his veneration of Napoleon, with whose most brilliant period his own youth coincided. He failed in Hamburg as a business man, was terribly bored at Göttingen as a scholar, was accepted while still young by the leaders of thought and letters in Berlin as poet and journalist, apostasised from the Jewish religion on practical grounds, visited England where he admired Canning and found Walter Scott wanting, and settled in Paris to make an imprudent love match which, while it lasted, brought great happiness, and supplied him with an unboundedly affectionate attendant through his terribly protracted and fatal illness. This story Mr. Baerlein tells with great fullness of incident in a clear and pleasant way that should lead many who can read German to enjoy the poet's gay and serious phases, his wit, his penetration, and his lovely literary gift.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES, Vol. XXV., October-December.—Dr. C. C. Beatty contributes a paper on Congenital Stenosis of the Œsophagus, in which he has collected and tabulated 50 cases reported in the literature up to 1926, in addition to five examples of the condition which came under his own observation. He distinguishes a membranous type in which there is a partial occlusion of the lumen by a fold of normal mucous membrane, and a non-membranous type in which there is a localised reduction in the size of the œsophagus. The onset of symptoms is usually in infancy, the most characteristic symptom being regurgitation of food a few minutes after deglutition without either pain or nausea. Adult patients may be well developed, but some degree of infantilism is not uncommon in children and adolescents. The prognosis in the membranous type is good, and in the non-membranous type is not unfavourable, as several patients have lived to old age. The best treatment in the membranous form is dilatation by bougies controlled by œsophagoscopy. In the non-membranous form a few successful results have followed radical operation. —In a paper on the Rheumatic Child, based on his study of 400 cases at the Downs Hospital, Sutton, and Queen Mary's Hospital, Carshalton, Dr. N. Gray Hill shows that there are no physical characteristics peculiar to rheumatic children, such as colour of the hair, colouring of the eye, or absence of cutaneous pigmentation, and maintains that the belief that there is a rheumatic type cannot be substantiated. He also brings forward evidence that there is very little, if any, connexion between the life and work at school and the onset of rheumatism or chorea.—Dr. F. Parkes Weber records a case of a "White" Nævus of the Conjunctiva in a Child and a Dark-blue Nævus of the Forehead.—In their paper on Erosion of the Neck Vessels in Scarlet Fever Dr. J. D. Rolleston and Dr. W. Gordon Sears report two fatal cases of this rare complication which they had seen at the Western Fever Hospital in the course of six months. The first was a male infant, aged 11 months, who, in the course of moderately severe scarlet fever complicated by suppurative cervical adenitis and otorrhœa, had profuse hæmorrhage from the ear and died in a few minutes. The bleeding vessel was not identified post mortem, but probably one of the veins in the neighbourhood of the cervical abscess had been eroded. The second case was that of a female infant, aged 2 years, with a septic attack of scarlet fever, also complicated by suppurative cervical adenitis. In this case the hæmorrhage took place from the wound in the neck where the cervical abscess had been opened, the source of the hæmorrhage being the internal jugular vein.—The abstracts from current literature are devoted to ophthalmology.

NORWEGIAN STUDIES IN SYPHILIS.

CRITICISM OF THE RESULTS OF SPECIFIC TREATMENT.

THE late Dr. Cæsar Boeck, professor of dermatology at the University of Christiania (Oslo), has left a tradition which was the subject of a long and interesting discussion at a meeting of the Norske Medisinske Selskap last year. The paper which Dr. E. Bruusgaard read on this occasion is published in *Norsk Magazin for Laegevidenskaben* for December, 1928, and the report of the discussion which followed it appears in the same journal for October.

Prof. Boeck used to arouse many protests among his colleagues on account of his teaching that the so-called specifics, potassium iodide, and mercury, are symptomatic remedies which not only fail to eradicate the disease, but also paralyse the body's natural defences, with the result that the disease runs an atypical course, and inflicts serious injuries on certain internal organs, particularly the central nervous system. Only when the body failed to react satisfactorily, and the disease seemed to run its course unchecked, did Boeck fall back on these two drugs. His colleagues, on the other hand, followed more conventional lines. They taught that mercury must be given in every case, in such-and-such doses, and for so many years. It was, therefore, natural that the generations of medical students brought up in this controversial atmosphere should have been curious to check such conflicting claims in the light of subsequent events. Two of these men have, in their turn, become leaders of the medical profession in Norway, one of them, Dr. Bruusgaard, having succeeded Boeck in the Chair of Dermatology, the other, Dr. S. Dahlström, being chief of the Psychiatric Department of the Ullevaal Communal Hospital in Oslo.

The task which Prof. Bruusgaard set himself was the personal examination of the survivors of the syphilitic patients who had attended Boeck's clinic between Jan. 1st, 1891, and Dec. 30th, 1910. Of the 2181 patients suffering from primary and secondary syphilis in this period, 1388 were women and 793 were men. Prof. Bruusgaard's inquiries into their subsequent fates were begun in 1925 and provisionally ended in 1927. A small number of patients were also examined who had contracted syphilis since 1910, and who had not received specific treatment. On re-examination, the patients were subjected to a very careful examination of the heart, two skiagrams being taken in different planes, and to a routine neurological examination. The cerebro-spinal fluid was examined only in a few cases, but the Wassermann reaction of the blood was carried out in most cases.

After grouping his material in several tables, the first showing the frequency of such complications as iritis and periostitis, the second showing the subsequent careers of the patients whose infection dated back three to four decades, and the following tables showing what happened to the patients whose

infection was more recent, Prof. Bruusgaard summed up his findings as follows :—

From 3 to 40 years after infection an examination was made of 309 patients who were still alive and a study made of the 164 patients who had died, and the cause of whose death was known. Of the total of 473 ex-patients, alive or dead, 131 were clinically symptom-free and gave a negative Wassermann reaction. There were 70 who were clinically symptom-free, but gave a positive Wassermann reaction. There were 67 who suffered from diseases of the blood-vessels, 13 who suffered from general paralysis, and 6 who suffered from tabes. As practically all the cases of general paralysis in Oslo and the neighbourhood are recognised as such and included in the returns, only a negligible quantity being lost sight of, it may be argued that the 13 patients who developed general paralysis represented almost the sum-total developing this disease out of the 2181 patients whom Boeck refused to treat with the so-called specific remedies. In other words, only 0·6 per cent. of all these patients developed general paralysis. While Prof. Bruusgaard took care not to commit himself to a definite opinion on the wisdom of his predecessor's attitude of masterly inactivity, he pointed out that the statistics he had just presented proved very clearly that, in a considerable percentage of cases, the body is by itself able, not only to arrest the progress of syphilis, but even to eradicate this disease. This observation gives support to the modern tendency to combat syphilis by means of non-specific remedies which augment the natural defensive forces of the body —witness the success of the malarial therapy of general paralysis.

Does Specific Treatment Favour Development of G.P.I. ?

In the discussion which followed Prof. Bruusgaard's paper, Dr. Dahlström pointed out that the most commonly accepted computation of the frequency with which cases of syphilis end in general paralysis is about 4 per cent. During the 18 years he had practised as a psychiatrist, Dr. Dahlström had been on the look-out for paretics among Boeck's old patients, but had hardly found any, whereas patients who had been treated with mercury frequently reappeared with signs of general paralysis. Boeck used even to claim that not one of his own patients had ever developed general paralysis, and every time he met Dr. Dahlström he would ask if he had seen any of his (Boeck's) patients suffering from general paralysis. When the answer came in the negative, he would pass on, remarking, " Didn't I say so ! " Among the 320 cases of general paralysis treated at Ullevaal, only two were found to have been treated on Prof. Boeck's principles. Even in these two cases it could not be proved beyond a doubt that they had not been tampered with, i.e., that they had not received mercury from some other doctor. Boeck used to teach that even the smallest dose of mercury made the prognosis worse for the patient. In further confirmation of Boeck's teachings, Dr. Dahlström drew attention to the rarity with which tramps and other light-hearted birds of passage—persons who do not submit to specific treatment—develop general paralysis. It is also rare in the coloured races in their native haunts, but it is not so among negroes living in large towns where hospitals, doctors, and specific remedies are available. Dr. Dahlström also noted that a past record of syphilitic meningitis or cerebral disease does not forecast general paralysis at a later stage. Indeed, among the 95 patients he had treated in hospital with these manifestations of syphilis, he had not seen one subsequently develop general paralysis. This observation did not, of course, refer to those cases of general paralysis which were ushered in by signs of meningitis or lues cerebri.

The Frequency of Syphilis at Necropsy.

Speaking at the same meeting, Prof. Harbitz gave a statistical review of his post-mortem findings at the Rikshospital in Oslo during the 28-year period, 1900–27, in which 6529 necropsies were made. In 369, or 5·65 per cent., definite syphilitic changes were found, and in 303 of these cases (4·68 per cent.) syphilis was regarded as the cause of death. The blood-vessels were involved in 202 cases, the nervous system in 55, the digestive tract in 28, the respiratory tract in 18, the skin in 24 (incidental findings, not causes of death). Amyloid disease was found in 13, severe anæmia in 3 ; the bones were involved in 8, the testicles in 3, and the kidneys in 8 cases. There were also seven cases in which secondary syphilis was an incidental find. The most important point to note in these findings is the predominance of the blood-vessels and the central nervous system as seats of syphilis that proves fatal. And syphilis of the arteries and heart was three to four times as common as syphilis of the central nervous system. With regard to the suggestion that tertiary visceral syphilis has increased in frequency, Prof. Harbitz had grouped his material in two 14-year periods. In the first, 1900–13, there were 3272 post-mortem examinations, among which syphilitic changes were found in the organs in 214 cases—i.e., in 6·54 per cent. In the following 14-year period, 1914–27, there were only 155 such cases among 3318 necropsies—i.e., only 4·82 per cent. Prof. Harbitz added that his post-mortem findings must be regarded as representing only a fraction of the total number of syphilitics examined post mortem.

The Expectation of Death of the Syphilitic.

During the same discussion, Dr. E. H. Hansteen produced some interesting figures wherewith he calculated the chances of syphilitics dying of their disease. His material consisted of the post-mortem records of the Ullevaal Communal Hospital in Oslo in the period 1907–25. Among the 11,477 post-mortem examinations there were 465 cases in which definitely syphilitic changes were found in adults (acquired syphilis) and 50 other cases in which the changes found were probably syphilitic. This gave a total of 515 cases—i.e., an incidence of 4·49 per cent. In 247 cases syphilis was the cause of death (2·17 per cent.), whereas in 268 other cases (2·32 per cent.) syphilis was an incidental find and not the principal cause of death. Among the 247 fatal cases of syphilis, there were 161 in which it was located in the heart and vascular system, 72 in the central nervous system, and 1 in the liver. There were three cases in which it gave rise to general amyloid disease. Also, in the 268 cases in which syphilis was an incidental finding, the structures most often involved were the heart and blood-vessels. In the same period congenital syphilis in infants was demonstrated in 101 cases ; it was the cause of death in 72, and an incidental finding in 27. There were also two cases of late congenital syphilis in adults. If the cases of acquired syphilis be added to the congenital forms of the disease, there is a total of 616 cases (5·36 per cent.), of which 321 (2·78 per cent.) proved fatal on account of this disease. Assuming that the 11,477 persons examined post mortem at the Ullevaal Hospital were a representative sample of the population of Oslo, Dr. Hansteen proceeded to make the following calculation. With a population of about 250,000, and an average annual death-roll of 2700, there must have been approximately 59 deaths every year from acquired syphilis. The notifications of acquired syphilis in Oslo range from 400 to 900 a year, the average for the period 1907–25 being 627. To this average Dr. Hansteen added about 30 per cent. in order to make good the new cases of syphilis which elude notification. By this means he arrived at a total of 836 new cases of syphilis every year. As approximately 59 persons die every year of acquired syphilis in Oslo, the calculation is made that 7·06 per cent. of persons contracting syphilis will ultimately die of this disease. The actuarial value of this calculation is, of course, impaired by the element of guessing in it, but it remains nevertheless a useful starting-point for similar investigations and calculations by other pathologists.

THE LANCET.

LONDON: SATURDAY, JANUARY 19, 1929.

THE KING'S ILLNESS.

FOR the first time for seven weeks HIS MAJESTY'S lness is not made in this column the subject of an fficial bulletin, a fact which proves how correct have een the prognostications of his advisers when they ere able from time to time, in the most cautious rms, to report some progress. There is no doubt iat the regular bulletins, containing information iade up of the salient facts for those who could ppreciate them in their proportions and inter-elations, have been extremely valuable to the KING'S nxious subjects. Never has it been disguised for a ioment that HIS MAJESTY was seriously ill; never as the temptation to allay widespread apprehension een yielded to, so that undue stress was laid upon ven undoubted steps towards recovery. Void of hetoric, and in as simple phraseology as the language f science permits, the story has been told from week o week in the right way.

The bulletins since the last issue of THE LANCET ave been signed by Sir STANLEY HEWETT and Lord)AWSON, two only of them carrying also the signature f Sir HUGH RIGBY, whose silence implies a satis-actory issue to surgical interference. The bulletins ell the same story of very slow progress, a "quiet ay" and a "restful day" culminating in an affirma-ion that HIS MAJESTY continues to make slow rogress. No medical man will fail to appreciate how nxiously the patient must continue to be watched hrough an extended period of time, for an illness o prolonged and so severe must always leave the ubject liable to an addition of exhaustion which has hroughout been dangerously pronounced. That is to ook upon the gloomy side; but at the long last we nay permit ourselves to indulge in happy anticipations f convalescence.

TRAINING IN BIOLOGY.

Two leaflets issued last week from the Ministry of griculture and Fisheries lay stress on a large and rowing demand, existing throughout the British mpire, for men trained in biology. The new propa-anda is, as would be expected from its place of origin, rgely concerned to point out the need, alike at home nd in our colonies, for biologists to combat insect nd fungoid diseases, to breed improved varieties of rops, to advise on livestock and its breeding while nproving meat and dairy produce, to fight animal iseases, and to provide scientific information in respect of the storage and transport of agricultural products. The Ministry suggests that there is a lack of facilities in our schools and universities for the training of biologists fit to discharge such duties, and that there is a dearth of school teachers able to impart knowledge of a branch of science which many persons to-day would consider to be a desirable part of the regular school curriculum. In both leaflets tabular statements occur which testify to the increase of research and advisory service, for England and Wales, that has been financed by the Ministry of Agriculture in the last ten years, the experience of Scotland being similar. The number of posts available and, at the same time, the demand for biological research has grown more acute year by year, and the opportunities for the employment of special biological equipment continue, and will continue, to expand. The message from the Ministry of Agriculture and Fisheries is a practical one, being—Here are openings for useful employment which are not being filled, and men are not being trained to fill them in sufficient numbers.

The Ministry of Health and the General Medical Council will be in accord with this message, for the training of the medical student in biology presents in many places a difficult problem, adequate opportunities for teaching not being forthcoming. In speaking of medical education, it is true, we are thinking of biology only in simple terms as a school subject; the ground-work must be done, while consideration may be left aside of the many directions in which biological research of the most highly specialised character plays its part in therapeutics. Biology, physics, chemistry, and biochemistry are the fundamentals of the medical curriculum, a proper acquisition of which must be obtained if anatomy, physiology, and, in due course, the principles of pathology are to be mastered; and a dearth of instruction in biology has produced a definite difficulty in medical education. Whether any change of policy may have to be adopted by the General Medical Council for lightening the burden of our medical curriculum, or whether the existing pattern be retained, it must be equally embarrassing that, of the three great preliminary subjects, one cannot be taught with facilities proportional to those provided for teaching the others. And it is doubtful whether we fully recognise, in the education of medical students, the high significance of training in biology, a default which an address [1] by Dr. F. A. E. CREW, Professor of Animal Genetics at Edinburgh, should remedy. Speaking on the position that biology should occupy in education, Prof. CREW points out that general education should be concerned with "the development of the art of living, with teaching the developing individual how to think and how to feel and how to seek and gain opportunities for exercising these faculties." Following on this definition, he points out that as the scholasticism of the Middle Ages gave way to the humanism of the Renaissance, so the *literæ humaniores* must give way to education in science, for he believes that science could replace in the school curriculum,

[1] Nature, Jan. 12th, 1929, p. 54.

and replace adequately, the humanistic philosophy of life. This thesis he supports eloquently, pointing out that biology has progressed towards the method of experimental analysis, while its conclusions are based increasingly upon experimentation, so that biologists speak of facts that cannot be denied any more than their connexion with the welfare of mankind. Thus firmly set upon its foundations biology becomes a fitting school subject.

Medical men want no convincing that biology could be included in a normal school curriculum with great advantage to pupils of all sorts—it is precisely that omission which introduces the difficulty for the General Medical Council in deciding how far the overcrowding of the medical curriculum could be relieved at the beginning of the course. It is clear that those who have charge of medical education cannot ask students of medicine before registration to satisfy them that they possess a standardised knowledge of biology, while many of those students cannot obtain a practical opportunity of studying the subject at all, and the gap has still to be filled by classes in the medical school itself. But if biology should thus take its place in the general scheme of education, the greatest pains must be taken to avoid, in the early stages of inculcation, any approach to specialism. The subject will have to be taught as the background of zoology, botany, and physiology, and also as one that requires the assistance of chemistry and physics for the appreciation of its phenomena.

NEUROSIS AND WORK.

A DISCUSSION on mental hygiene, reported in THE LANCET of Jan. 5th, brought from Dr. EDWARD MAPOTHER a comment which emphasises the existence of diametrically opposed modes of treatment of the neurotic or the neuropath. Is he to be shielded from stress and have his life made easy for him, or is he to be taught the doctrine of courage and made to struggle against the risk of breakdown? Dr. MAPOTHER upholds the second alternative, and notes with undoubted truth that much of the best work of the world is done by potential neuropaths putting up a great fight against the risk of a breakdown. PIERRE JANET, who still stands unrivalled as a clinical observer, is less hopeful, and with many patients adopts the attitude that their *tension psychologique*—or vital urge, as we might call it—is so low that their life task must be adjusted to it. Yet another aspect is to be found in Sir JOHN GILMOUR'S address at the Annual Congress in St. Andrews of the Scottish Education Institute, when he warned students against the danger of breakdown from educational over-pressure, and made the shrewd observation that girls do not always succeed in treating the demands of learning with the philosophic calm which boys are able to command. His theme has been given popular expression in the saying, "If you give a girl too much to do she'll break down; if you give a boy too much to do he won't do it." Often enough the clinician, dealing with adult breakdowns ascribed to overwork, is told that the overwork was unnecessary, that the patient drove himself harder than he needed; in short, that he overworked because he was neurotic. JANET made a group for such cases, giving them the title of *les scrupuleux*, and it is not sufficiently recognised that many nervous people are overscrupulous, over-critical of themselves, and a prey to a restless urge to perfection that can never be reached. In the same person these qualities can lead to brilliant and original work or serious breakdown, or both. The symptoms often fall into the category of obsessional states, and Miss MAY SMITH and Dr. MILLAIS CULPIN, working for the Industrial Fatigue Research Board, have made the observation that these subjects produce results on the MacDougall-Schuster dotting-machine that cannot be approached by any subjects free from nervous symptoms. It is neurotics of this type whose life is too often ruled by the proverb that what is worth doing is worth doing well. For them such counsel is pernicious; they rarely need urging to further exertion, and require rather advice on saving themselves from those introspective criticisms and doubts which, when exaggerated, form the pattern of their nervous breakdowns.

The position of the sufferer from pathological anxiety is different. Though it must not be supposed that there is a clear diagnostic line between the two types, certain distinguishing features may be recognised. The people described above may suffer acutely from anxiety in certain situations—as when alone, or in a crowd, or on a height, according to their individual phobia—but usually have no bodily symptoms, not even a rapid pulse, except when they are actually struggling against an obsession. The patient with anxiety neurosis, on the other hand, will often exhibit physical symptoms ranging from palpitation and sweating, to indigestion and headache, and has nearly always a rapid pulse. The latter type, whose anxiety is unfitting to the circumstances and arises from sources in his unconscious, must often, in the absence of facilities for psychological treatment, be counselled to admit the existence of his troubles and carry on his work in life with such extra effort as would be necessary with a physical disability. The research workers mentioned above have distinguished between neurotic symptoms and neurotic disability, for in some manual occupations people were found doing good work without nervous breakdown, in spite of the presence of severe anxiety symptoms. It must, however, be emphasised that the symptoms remained; nothing in the work stimulated them, but we may suppose that a less fortunate choice of occupation would have resulted in disability. A great amount of sickness results from anxiety states or physical conditions arising out of them, and it is only by a close study of each case that one can strike the right balance between allowing the patient to give way too readily and failing to recognise when his symptoms make work impossible. A pitfall always to be avoided is the easy assumption that hard work per se can cause nervous breakdown, an assumption contrary to all modern psycho-pathology. Worry often arises from causes within the patient rather than from external working conditions, and it is a human failing to turn aside from the consideration of inner troubles if something external can serve as a scapegoat. Neurotic symptoms are a sign of disharmony, of maladjustment to the demands of life, and if external stress exacerbates them, they may serve as a means of escape from that stress; they are, nevertheless, real to the sufferer, as real as any more obvious physical disorder, and to deny this reality is an elementary error that deprives the one who makes it of any influence he might otherwise possess. To understand the reality is to go far towards attaining that coöperation with the patient which will enable us to give him courage to bear the stress of life or to make such reasonable concessions and adjustment as his emotional difficulties require.

BRONCHO-PNEUMONIA.

THE threat of influenza, which cannot be overlooked, makes the problems of broncho-pneumonia, especially when young subjects are attacked, of particular interest. Each year, as winter proceeds, the practitioner has to grapple with a number of cases of acute respiratory disease. Although most of these are of the minor kind, typified by the "common cold," which causes merely a few days' discomfort to the individual, they provide the source of infection for a large number of serious cases of broncho-pneumonia. The public finds it difficult to believe that the cause of the common cold is still unknown and, indeed, it seems curious that we cannot ascertain whether the bacteria commonly found—pneumococci, streptococci, *B. influenzæ*, *M. catarrhalis*, *B. septus*—are primarily responsible, or are secondary associates of an undiscovered filterable virus. There is general agreement, at any rate, that the more serious complications, such as broncho-pneumonia, are caused principally by the pneumococcus, streptococcus, and influenza bacillus in varying combination. In recent years the influenza bacillus and the hæmolytic streptococcus appear to have played a prominent rôle. Acute lobar pneumonia has not the same close relation to these minor infections as broncho-pneumonia. Its seasonal incidence is different, and the well-defined virulent types of pneumococci which cause the majority of cases are not those found in the milder catarrhal infections. Nevertheless the pneumococci of lower virulence, which in an adult may only cause a simple coryza, can be responsible for pneumonia in weakly subjects and children.

We cannot yet distinguish clinically and bacteriologically between harmless colds and those which may become dangerous. Probably there is no essential difference, and the result depends upon the relation between the size of dose of the infection and the individual resistance. The term "influenzal cold," though loosely used, is popularly supposed to denote a graver condition than a simple cold, and there is something to be said for its application to a type of cold which closely resembles and is probably often identical with the simple influenza seen during epidemics. It is characterised by a more abrupt onset, a higher temperature, more severe headache, greater aching in the back and limbs, and a drier catarrh. Experience shows that such colds are more likely to show spread to the lower respiratory tract, the danger sign being the appearance of râles, coarse, medium, or fine, scattered through the lungs, especially in the lower lobes. These signs indicate bronchiolitis, which is the essential lesion of influenza. They are apt to be very persistent, and so long as they exist there is a possibility of broncho-pneumonia. Infants under 3 to 4 months old who get a nasal catarrh almost invariably have an extension to their bronchi and often a broncho-pneumonia. An infection which may be negligible in an adult can cause fatal disease in a young child who has not yet been immunised by frequent sub-morbid doses of infection. In spite of every care broncho-pneumonia may arise in patients who apparently have a mild catarrh; but undoubtedly strict observance of the rule that a febrile patient must stay in bed would do much to prevent complications. Patients should be kept in bed until the temperature has been normal for 24 hours or, in more severe cases, until all râles have disappeared. When broncho-pneumonia supervenes the signs may appear on the third or fourth day without any previous drop in the temperature, or they may occur after apparent recovery four to ten days later. Fulminating cases, with lung involvement from the first, are not so often seen in inter-epidemic periods.

We know no drug which will check an influenzal cold, and it is difficult to improve upon the old-fashioned remedy of promoting profuse perspiration by a hot drink of lemonade, with or without whisky, and grs. 10 of Dover's powder, and going to bed with a hot-water bottle and extra blankets. Abundant fluids should be taken, up to 4 or 5 pints a day, and as there is no desire for food the addition of glucose, 1 lb. to each 3 pints of lemon water, will provide all the nourishment needed by the patient. With any sign of lung involvement absolute rest, physical and mental, must be insisted upon. Too often the patient is allowed to get up for excretory purposes so long as he is physically able to do so, but in spite of protests the doctor should be adamant upon this point. The nurse must anticipate the patient's wants and refrain from fussiness. Much unnecessary exertion is caused by reaching out for drinking vessels and sputum mug, by routine washings, and removal of garments. A single garment, slit down the middle, light bed clothes, and a cool room will help the patient to lose heat. Windows should be open day and night, but the need for fresh air should not expose the patient to icy draughts or glaring sunlight. The patient is thirsty rather than hungry, and glucose lemon-water should be taken freely. With this milk can be reduced to 1 pint a day. There is still a misplaced confidence in beef teas, but their nutritive value is magnified and they may be objectionable on account of the amount of extractives they contain. Careful attention to the cleanliness of the mouth will add to the patient's comfort and safety. Three grains of calomel at the onset, followed by a saline, may be given, but thereafter a soap-and-water enema on alternative mornings will suffice. The pain of pleurisy may require strapping, antiphlogistine, poultices, or leeches, but they should not be continued after pain has ceased. A Dover's powder will relieve pain and sleeplessness, and opiates can be continued so long as the bronchi are clear and there is no cyanosis; otherwise all drugs that cause sleep are dangerous.

Undoubtedly the hope of lowering the high mortality from the pneumonias lies in the discovery of some form of specific treatment. Specific chemotherapy has so far failed in connexion with bacterial infections. The use of vaccines has not yet been generally accepted, but the records of those who have used them extensively are undeniably good. As with all methods of specific treatment they must be used as early as possible. Their object is to control the infection at the beginning and prevent dangerous developments; they can give little or no assistance when toxins, maybe in fatal doses, are already fixed in heart and nerve cells. The vaccine which has been most used is one containing equal numbers of pneumococci, streptococci, and influenza bacilli, and a suitable dose for an adult is 100 millions of each organism, though much larger doses can be given with safety. With such treatment given within the first 24 hours from the onset in a large proportion of cases, it has been shown that the temperature falls to normal within the following 24 hours, but with each day's delay less striking results are obtained, and when injection is delayed until the fourth day the results are little influenced. The immediate action of the vaccine is non-specific, but specific antibodies are produced later and add to those formed naturally. As specific antibodies are not present for several days, the patient is unsensitised and no negative phase supervenes. It is the fear of the

negative phase which has hindered the use of vaccines in acute infections. In chronic infections specific antibodies are present, the patient is sensitised, and reactions are easily produced, so that when vaccines are used for delayed resolution in pneumonia, or are not used until the patient has been ill for more than five days, caution is required, and the initial dose should be small—for example, 5 millions. The early administration of vaccine necessarily entails early diagnosis. The abrupt onset and striking symptoms of lobar pneumonia should make its recognition possible before consolidation occurs, but with broncho-pneumonia the onset is often insidious, and the fact that a case has taken on a graver aspect is not always recognised at once. It is not, however, necessary to wait for undoubted signs of pneumonia, since injection in the prepneumonic stage will, in most cases, cut short the infection and prevent the onset of the grave complication.

With early specific treatment, absolute rest, and fresh air, much can be done to prevent circulatory failure, the treatment of which occupies so much space in text-books. The heart is best helped by feeding it, and the best foods are oxygen and glucose. With the slightest indication of cyanosis, oxygen must be freely administered through a nasal catheter or with a mask. The futile method of the funnel, however, still survives and brings oxygen treatment into discredit. When circulatory failure occurs the patient is in a parlous condition. One by one the drugs upon which we formerly relied have been discredited, and the difficulty of treating poisoned organs incapable of response is now recognised. The seat of circulatory failure has passed with our increasing knowledge from the heart to the medullary centre and the capillaries. When the heart is at fault adrenalin is the most useful drug since it augments and accelerates its contractions. For capillary dilatation pituitary extract is available, and when failure of the vasomotor centre occurs strychnine has a certain limited field. Alcohol, the most popular of all drugs in pneumonia, has a fleeting reflex action upon the heart from irritation of the mucous membrane of the mouth and stomach, but after absorption it has no apparent action upon the heart or blood pressure and it is difficult to see how its action in increasing the flow through the skin at the expense of the internal organs is required. Circulatory failure is a complicated matter, and it is at present impossible to assess the various factors concerned, each of which requires a different line of treatment. Our hope lies in the prevention of circulatory failure and not in its treatment.

Convalescence may be a tedious matter and râles a long time disappearing, but the patient should not be allowed to pass from care until the chest is clear. Chronic fibrosis is perhaps the commonest chronic lung disease, and the most frequent cause is a broncho-pneumonia. Much future ill-health could be prevented by greater care during convalescence, and the lungs after broncho-pneumonia should be as carefully watched as the heart after acute rheumatism.

INTERNATIONAL HOSPITAL CONGRESS. — This Congress will assemble at Atlantic City, New Jersey, U.S.A., on the morning of June 13th. It will be immediately followed by the annual convention of the American Hospital Association. The Congress is the first of its kind and in connexion with it there will be an exhibit of plans and models of modern hospitals, of various types of hospital equipment and supplies, and of statistical data relative to the care of the sick throughout the world. The purpose of the Congress is to bring together those interested in hospital administration, construction, and organisation.

Annotations.

"Ne quid nimis."

CONDITIONS OF CHILDBIRTH IN INDIA.

THE disturbance created by Miss Mayo's book "Mother India," has by no means died down, and acrimonious controversies arise from time to time over one or other of its criticisms of Indian social life. It is not our purpose here to reopen any general discussion of the merits of this work, but an article by Miss Eleanor Rathbone in a recent *Hibbert Journal*, entitled "Has Katherine Mayo slandered 'Mother India,'" lays especial stress on her remarks on childbirth, and it seems worth while to consider what the present position really is, and whether any practical means of improvement exist or can be introduced. That there is abundant evidence of very excessive mortality of both mothers and infants must be at once conceded. Indian vital statistics are notoriously inaccurate, but as Miss Rathbone points out, any error in the calculated death-rate can safely be assumed to lie in the direction of deficiency rather than excess. When, therefore, it is stated on good authority that a maternal mortality of 20 per 1000 births is a very conservative estimate we may regard the figure as certainly not an exaggeration of the facts. It has to be compared with a British figure of between 4 and 5 per 1000; similarly the infant mortality of about 300 per 1000 for urban and 175 for rural districts in India compares unfavourably with a general rate of 70 for England and Wales and 35 in Dunedin, New Zealand. These figures leave so large a margin for any possible error that they can be allowed to speak for themselves. Besides, the main proposition has long ago been conceded by the leading Indian reformers themselves.

The causes of this sad and discreditable state of things are not far to seek, for anyone with experience of Indian maternity work knows that the conditions under which labour occurs—with comparatively few exceptions amongst the more prosperous and better educated people of the towns—are truly appalling. This is a matter on which Miss Mayo could hardly have exaggerated, even had she intended to do so. When she says that the lying-in woman, being conventionally unclean, is installed in the darkest and dirtiest closet available, and provided with filthy rags that have been specially set aside for her use, that air and light are carefully excluded and the room is filled with the fumes of a charcoal brazier; that the *dai* or hereditary midwife in attendance is not only illiterate but notably dirty in her person, and regardless of the most elementary rules of cleanliness; and that the patient's diet is on starvation lines and utterly unsuitable—when she says all this, and also points out that the mother is herself usually the product of an early marriage, and often of the purdah system, she is only stating what is a commonplace to every practitioner in India. All these factors react more or less on the infant as well as the mother, and what chance it has of making good is still further weakened by its being fed on poor breast milk, or over-diluted cow's milk drawn and kept under more than doubtful conditions, and often also by the administration of opium to still its cries of hunger and pain. The purdah system coupled with a general defiance of every law of hygiene, is also responsible for more than vague ill-health. Osteomalacia and rickets are common, as one would expect, and the zenana is naturally a hotbed of tuberculosis. What, asks Miss Rathbone, in effect, can be done to secure the mitigation of these and other similar ills in the future? And must not Westerners, who have been responsible for the government of the country for so long, take blame to a certain extent for their continuance?

There has certainly been a tendency in the past to accept Indian social customs as inevitable, and to disclaim responsibility for their perpetuation, and so

ar we believe the British administration must bear s share of the discredit. The official efforts that have een made to improve maternity conditions have in he past been mostly feeble and sporadic. In the last alf century, however, some significant changes have ccurred, in this as in other social departments. The 'arsees of Bombay are, of course, not actually Indian n origin, but they have assimilated many Hindu ustoms, and their communal life is still largely lominated by a comparatively illiterate priesthood. n spite of this, however, and the violent opposition ie at first encountered from a large proportion of his ompatriots, the campaign initiated by Sir Temulji Nariman, M.D., for the introduction of modern naternity measures, has long ago been brought to a riumphant conclusion, and the Parsees, who used to e as archaic as the Hindus in this respect, have now is good obstetric facilities as any community in the vorld, and make use of them to the full. This advance could not have been made without a parallel introduc- ion of education, particularly for the women, and Miss Rathbone justly observes that this is the irst and most pressing need of India. Along with this general educational movement must go he supersession or training of the *dais*. It has been the fashion until recently, particularly amongst he medical profession, to contend that the attempt to make them into responsible assistants to deal with the *dai* is hopeless. We think this view s wrong. India, in spite of the legendary pagoda tree, is a poor country, and to wait for an ade- quate supply of midwives trained on conventional lines would be to wait for a very long time. The *dai* is an awkward problem, but experimental schemes on a small scale have lately shown that it is not impos- sible to persuade her to undergo short courses of practical training which, in successful cases, convert her from a deadly menace into a useful adjunct of village life. Rural midwifery presents a task whose very fringe the regular nursing profession will never be able to touch, and the regularisation of some inferior maternity agency, such as the *dais*, is even more necessary than the provision of elementary medical aid in the smaller villages, where fully qualified doctors are not available. The establish- ment of infant welfare centres in the larger towns has already done much to open up the allied question of antenatal instruction and to supplement the work of the hospitals as regards infants and young children, and the same principle might with advantage be extended to the districts, where it would be a valuable reinforcement to the existing medical agencies.

OPERATION FOR CONGENITAL STENOSIS OF THE BILE-DUCTS.

WHEN there is congenital abnormality of the bile-ducts the smallness of the structures involved and the associated jaundice have usually deterred surgeons from operating, and comparative failure seems to have attended the efforts of those who have made the attempt. But a fresh stimulus to the surgical treat- ment of this condition is given by the work of W. E. Ladd,[1] of Boston. He operated on 11 out of a series of 20 children with narrowing of the ducts, and found that eight were suitable for surgical treatment, six of whom recovered. These six include one infant of 3 months with atresia of the common duct, for which choledochoduodenostomy and cholecystostomy were performed; one of 5 months with the same abnorm- ality which was cured by cholecystgastrostomy; one of 3 months with stenosis of all three ducts, successfully treated by cholecystostomy and dilatation with a probe; and one of 4 weeks in which obstruction of the common and cystic ducts was relieved in the same way. In the other two cases partial obstruction of the common ducts was satisfactorily treated by chole- cystduodenostomy, but the patients were 5 years old, and the condition hardly seems to deserve the term congenital stenosis of the bile-ducts as it is understood in the literature. As Ladd remarks, both the nature and degree of abnormality vary considerably, so that different operations are necessary in different cases. For small infants with an obstructed common duct he recommends anastomosis of the common duct to the duodenum over a catheter, pointing out that introduction of a catheter into the duodenum through the gall-bladder and common bile-duct is an important part of the technique, as it ensures patency of the anastomosis which is otherwise difficult to obtain on account of the smallness of the structures. He thinks that operation is desirable as soon as the diagnosis seems reasonably certain, before there is wasting or concurrent disease, and he says it may be undertaken with expectation of success in any case in which either the common duct or the gall-bladder has a patent connexion with the liver. Only those who have seen such cases in life and examined the structures at autopsy can fully realise the technical difficulties of the operations which he advocates. But the fact that inactivity means certain death, while intervention evidently can be successful, undoubtedly justifies his plea that it should be tried more often. It will be interesting to learn the subsequent history of the cases operated on successfully.

[1] Jour. Amer. Med. Assoc., 1928, xci., 1082.

THE ÆTIOLOGY OF PELLAGRA.

IT is now more than a year since the fact was established that vitamin B is a dual entity, of which one part only, now called vitamin B 1, represents the previously recognised antineuritic or anti-beri-beri factor. The two factors have a somewhat similar distribution among foodstuffs, and yeast is particularly rich in both. Since yeast in some form has been almost universally used as the source of vitamin B in dietary experiments, it has come about that nearly always the two factors have inadvertently been given together. The second factor, vitamin B 2, has been further protected from discovery by the circumstances that, in experiments on the rat, when both factors are withheld the animal always succumbs first to the neuritic symptoms, and dies before any sign of the second syndrome has time to develop. In other words, the reserve of vitamin B 2 always outlasts that of vitamin B 1, when neither vitamin is offered in the food. H. Chick and M. H. Roscoe [1] found, last year, that an alcoholic extract of yeast, in which vitamin B 1 alone is present, cures the neuritic symptoms and keeps the rat alive until the second deficiency has time to manifest itself. The latter is marked by ophthalmia and skin symptoms —i.e., loss of hair and a characteristic dermatitis on paws, ears, and neck. The most interesting feature of the discovery lies in the identification, by J. Goldberger [2] and his colleagues, of this syndrome with the well-known disease of pellagra. They have proved that pellagra in man may be cured and subsequent relapses prevented by the administration of dried brewers' yeast, as well as by a number of other foodstuffs. They used a commercial prepara- tion of the Harris Laboratories, Tuckahoe, N.Y., at first in a daily dose of about 50 g.,[3] but later 15 g. was found sufficient.[4] In the outbreak of pellagra which followed the deprivation caused by the Missis- sippi floods,[5] yeast was prescribed as the routine treatment, with canned salmon, beef, or tomatoes as an alternative. The ætiology of pellagra is not, however, completely cleared up by these experiments, since the exact relation of pellagra to maize-eating is not yet fully established. The disease occurs on a large scale entirely in maize-eating countries, but it is not yet known whether the whole maize grain is pellagra-producing or whether only a certain fraction,

[1] H. Chick and M. H. Roscoe: Biochem. Jour., 1927, xxi., 698.
[2] J. Goldberger and R. D. Lillie: U.S.A. Public Health Reports, Washington, 1926, xli., 1025.
[3] Goldberger and W. D. Tanner: Ibid., 1925, xl., 54.
[4] Goldberger, G. A. Wheeler, Lillie, and L. M. Rogers: Ibid., 1926, xli., 297.
[5] Goldberger and E. Sydenstricker: Ibid., 1927, xlii., 2706.

left after milling, is responsible, as in the relation between rice and beri-beri. It should be easy to ascertain whether vitamin B 2 is present in maize, before and after milling. It is curious that some maize-eating communities, such as certain natives of South Africa, do not suffer from pellagra. The explanation of their immunity remains to be worked out; it may be traceable to a different process of milling. Whatever the exact circumstances contributing to its causation, the prevention of pellagra in man is in sight. The disease, like beri-beri, will be stamped out as soon as it is realised that it is poor economy for a State to allow its citizens to suffer from a disease which can be avoided by the provision of a more adequate diet.

BAYLISS-STARLING MEMORIAL FUND.

MANY of our readers will remember that an appeal was issued last year (see THE LANCET, 1928, i., 718) for subscriptions to provide a memorial to the late Prof. Sir William M. Bayliss and Prof. Ernest H. Starling. We learn that the results of this appeal have been such as to enable the committee to fulfil the objects which they had in view. The sum collected will, apart from subscriptions which are still arriving, amount by the end of January to something over £2600. Large contributions have been made by physiologists abroad, particularly in America and Germany, and from many distinguished members of the practising side of the medical profession. The Memorial Fund Committee wishes it to be made known how the sum raised will be disposed of. A small part of it has been employed in the preparation of a simple memorial tablet in bronze. This, which has been designed by Prof. A. E. Richardson, F.R.I.B.A., bears the words :—

WILLIAM MADDOCK BAYLISS, F.R.S.
1860 1924

ERNEST HENRY STARLING, F.R.S.
1866 1927

It is proposed to erect it in the entrance-hall of the department in which they spent so many fruitful years, where it will occupy a suitable place above the bust of William Sharpey. Most of the money, however, will shortly be transferred to the University of London to be held in trust for the creation of a Bayliss-Starling Studentship, the object of which will be to enable a selected graduate in science, or graduate or undergraduate in medicine, of suitable standing, to spend a year or more in acquiring a knowledge of physiology and biochemistry preparatory to commencing research work in that subject.

ULTRA-VIOLET LIGHT IN MENTAL HOSPITALS.

IT has become the custom to regard the provision of ultra-violet ray apparatus as a sign of progress in mental institutions, and to assume that committees which have the welfare of their patients at heart will add this form of therapy to their equipment. Its use is, however, still limited, as shown by the recent inquiry of the Actinotherapy Subcommittee of the Royal Medico-Psychological Association. A letter addressed to 200 mental hospitals elicited 47 replies, from which it was learned that 16 institutions had ultra-violet apparatus and eight more hoped to have it soon. The discussion on the subject at the Section of Psychiatry of the Royal Society of Medicine on Jan. 8th showed that the medical staff of mental hospitals who have had actual experience of "artificial light" are convinced that it is justified. If there are any to whom irradiation has proved itself a failure, they did not attend to put their experiences before the meeting. With certain reservations as to selection of cases and administration by experienced physicians—reservations which apply to this treatment in all forms of disease—the psychiatrists present agreed that real benefit had been obtained by their patients. Dr. Dove Cormac reported, on four years' experience of ultra-violet light at Parkside Mental Hospital, that the patients had shown a marked increase of body-weight, improvement in appetite and muscular activity, a slight average decrease in blood pressure, and distinct exhilaration. He held that, while the treatment was bad for hyperthyroidism and melancholia with agitation, it undoubtedly curtailed the depressive period in the manic-depressive psychosis, benefited mild melancholia and anergic stupor, and rendered the delusional patient more amenable and his delusions less dominant. He had found the carbon arc better than the mercury-vapour lamp. With his conclusions Dr. A. C. Hancock, of Barming Heath, agreed, laying particular stress on the value of local applications for septic foci. Sir Henry Gauvain gave an interesting account of the effects of heliotherapy at Alton on the minds of disabled children. Marked improvement was observed both in "mental age" and in cheerfulness. Dr. G. de M. Rudolf, of Claybury, sounded a warning note by exhibiting a weight chart extending over several years and showing periodic rises. Had only a small part of this chart been available, one of the rises might well have been attributed to the ultra-violet light treatment.

Another aspect of the problem was stressed by Dr. R. Bourdillon, who pleaded for "more light and less invisible radiation" in actinotherapy. The September midday sun in temperate latitudes at sea-level gave half a gramme-calorie of visible light per square centimetre per minute, whereas a patient standing three feet away from a mercury-vapour lamp received only one-hundredth of a gramme-calorie. Therefore 15 minutes of a mercury-vapour lamp was in this respect equal to 18 seconds of September sunlight. He urged that exposure to the mercury lamp should be called ultra-violet treatment and not light treatment. The carbon arc approaches more nearly to sunlight, but varies enormously according to the particular electrodes and other factors. Very little is known, continued Dr. Bourdillon, of the effects of ultra-violet rays, because they have so seldom been administered unmixed, but they certainly lead to the production of antirachitic vitamin D and they burn the skin. The vitamin D can be much more cheaply and easily provided by the oral administration of irradiated ergosterol, while the value of burning is difficult to appraise in general treatment though incontestable in some skin diseases. The visible and near infra-red rays certainly penetrate more deeply. The magnificent results of heliotherapy in surgical tuberculosis are undoubted, but here the effects of ultra-violet rays have not yet been accurately distinguished from those of other factors such as cold air. There was reason to fear that the great utility of ultra-violet radiation in some diseases had caused undue neglect of the even greater value of radiations of longer wave-length for general treatment. Dr. W. A. Potts admitted in the discussion that he had obtained very much better results in hospital patients than in private patients, and he ascribed this to the fact that light treatment in a hospital was a kind of social outing. The nervous patient was reassured by the "old hand," and the particularly depressed patient was always put next a cheerful one. Dr. Albert Eidinow pointed out that the mercury-vapour lamp was designed expressly for acute and subacute disease, to produce a rapid effect and the maximum change in the blood, and that these diseases could not be treated with lamps that gave out a great degree of heat. In mental diseases, as he said, we have a totally different problem and need quite different radiations. The chronic case calls for longer radiation and heat, a pleasant, warm, practically non-erythema-producing light, perhaps best supplied by a very powerful tungsten filament.

There is clearly a difference in outlook between the physician whose object is to improve the health

of his patients in any way possible, and the research worker whose aim is to further knowledge by accurately controlled tests. The mental hospital physician takes a lamp, groups a dozen patients round it, finds that they improve physically and mentally, and that their convalescence is hastened, and declares that ultra-violet light is a valuable factor in the treatment of mental disease. The physical chemist points out that three-quarters of the rays he is using are not ultra-violet at all, that the patients are receiving other kinds of treatment as well, and that many purely psychological factors come in. It is, however, for the scientific worker and the clinician to meet together and to clear up ambiguity, and there is urgent need for research to this end. Till the nomenclature is cleared up no one would deny to the clinician the right to administer and to extol a technique which in actual fact appears to him to do his patients good. The general conclusion seems to be that at the present stage—after all, a very early one—artificial sunlight treatment, particularly the carbon arc, is a good therapeutic measure for mental patients, even though its exponents have not yet distinguished between the various factors which may be responsible for the results obtained.

CHEMICAL WARFARE.

TEN years have passed since the war, and a generation is growing up that knows little of the experiences that led to the almost universal hope that war would become obsolete. That hope now seems remoter, and it is possible that the races of mankind will, like the characters in a Greek tragedy, be driven on to disaster by forces within themselves that use reason as a weapon rather than a guide. "If you wish for peace, prepare for war" is a maxim that, universally used, leads to preparations that progressively increase, and the statesmen of many nations are even now struggling to arrest the increase. One of the first of their efforts was directed towards the exclusion of the use of poisonous gases in warfare, and various international agreements have been signed with that object. Yet there is a belief, freely expressed, that our objections to its use are as futile as were our ancestors' objections to the introduction of firearms in war, and that no nation will, when put to the test, refrain from the employment of all the means at its disposal in spite of paper agreements. Further, it is argued that gas is a more humane weapon than high explosives, inasmuch as its use against the civil population would bring greater and speedier military and political advantage with less suffering and death. The side would win that first produced uncontrollable panic among the home population of the other and, since defence against hostile aircraft is apparently an unsolved problem, and poison gas is easily manufactured almost as a secondary product of industrial chemistry, we must admit the force of the argument and realise that in our next experience of civilised warfare its bodily effects will be brought home to all, irrespective of age or sex. With these considerations as justification, the St. John Ambulance Association has published a brochure by Major F. R. Humphreys, late R.A.M.C.(T.) and Royal Air Force, on Protection of the Civil Population in Chemical Warfare, which describes in simple language the effects of the different poison gases likely to be used, with the defensive procedure to be adopted by the victims, and outlines the special duties that would fall to first-aid units. In the preface Major-General P. S. Wilkinson announces that the manual has the approval of the Chemical Warfare Research Department of the War Office and assumes that detailed organisations will be set up to deal with the work of defence. Medical men who feel the need for information will undoubtedly find the manual useful; it deals only with the material issues immediately concerned with gas attack and makes no reference to wider questions that inevitably arise in the mind of the reader. These questions are, however, frankly faced by Dr. L. P. Lockhart in the January number of the *National Review*. This writer, indeed, considers the questions settled and anticipates a war in which gas attack upon the civil population will be the decisive weapon. He declares that "the hope that the use of gas against civilians can be prohibited is . . . opposed to the whole trend and evolution of twentieth-century warfare in its relation to the economic and scientific needs of the modern State." Viscount Grey of Fallodon is quoted as saying that "it is by bringing home to each succeeding generation what the realities of modern war are, how vastly more catastrophic and destructive it is to the whole population than ever before, that we shall form a public opinion which will help to secure peace," but the argument of Dr. Lockhart, in which he is supported by Mr. J. B. S. Haldane, is that poison gas is so humane that the public can be educated to anticipate its use and "trained to realise that, with the proper measures, they have little to fear." Our possible enemies must not be expected, however, to remain ignorant of these proper measures, and this latest advance in *Schrecklichkeit* will surely go the way of all other warlike inventions. We hope that the wit and goodwill of mankind will succeed in breaking this vicious circle but, if the outlook is as bad as Dr. Lockhart thinks, then it is plainly our duty to prepare ourselves for the work we shall be called upon to do in alleviating the sufferings of the civil population in the next war. The extent of this preparation is wider than one might expect; Dr. Lockhart advocates, for example, that city, borough, and county councils should be responsible for the creation and maintenance of adequate anti-gas defence, and he presses the new and urgent need for the removal of our large hospitals from the centre of London on the ground that they may cease to function in time of war. Perhaps it is well that we should be thus reminded of the alternatives before us.

A CHANCE FOR EPILEPTIC CHILDREN.

THE epileptic boy or girl who has been excluded from school because his fits are so frequent or severe is in an unhappy position. If school is an unsuitable place for him, small homes or crowded streets are more unsuitable still. To the handicap of this disease is added the further handicap of want of education. He grows up literally without a chance in life. Medical men who come across these cases in private practice, or in the out-patient departments of hospitals, will therefore be glad to know that there is to be a further opportunity for London epileptic children to go to a school in the country, where they will receive the education of which they stand so much in need, combined with active medical supervision and treatment. The London County Council has arranged that some 80 additional places shall be made available at Lingfield Epileptic Colony, Surrey, where the instruction given resembles that associated with the ordinary public elementary school. In addition, manual training and open-air occupation are provided. The children are housed in villas and special attention is devoted to their comfort and recreative pursuits, whilst it is possible to ensure the regularity of hours so essential to successful treatment. Continuous observation, which is, of course, desirable for all patients suffering from epilepsy in its varying manifestations, is maintained by the medical superintendent, and the children are sent home as soon as their condition may be deemed to be arrested. In cases where the epilepsy persists, residence at the school is permitted up to the age of 16 years. Children between the ages of 7 and 14, resident in the County of London, are eligible for admission, and all applications should be addressed to the Education Officer, The County Hall, S.E. 1. In view of the fact that, in the past, there has been a considerable waiting-list, speedy application is

advised. The more urgent cases will receive priority but, subject to this proviso, applications will be dealt with in the order in which they are received, and every effort will be made to secure admission as early as possible. It should be noted that the provision at this school is made for educable children only.

SUPPLY OF EGGS TO HOSPITALS.

DURING the next few months the marketing of eggs will undergo a number of changes that may well give rise to fundamental reforms. The "national mark scheme," beginning on Feb. 1st, is a voluntary one, but already nearly a hundred accredited packers have promised their adherence to it. Under this scheme eggs will be graded for retailing in three classes, according to size, and only new-laid eggs will be sold under the "national mark." The scheme is designed to help British producers to secure the market in this country, and its success, of course, depends on the extent to which the producers seize the opportunity, and the purchasers support them by demanding "national mark" eggs. On March 1st there will come into operation a clause of the Agricultural Produce (Grading and Marking) Act, 1928, requiring retailers to mark all home-produced eggs that have been preserved. Later on, probably in April, an Order in Council will come into force, insisting that imported eggs shall be marked with their country of origin, and another clause of the Act will require all home-produced eggs that have been cold-stored or gas-stored to be marked before they leave the store.

These changes affect the public health very closely. Eggs are extensively used in the home and play an important part in many invalid diets; they are easily prepared, readily assimilated, and contain more nutriment than most other natural foods. But it is important that they should be fresh. Mr. James Gatecliff, in an interesting booklet [1] on the subject, goes so far as to say that the stale egg is not merely useless but actually harmful, and proceeds to criticise the supply of eggs to hospitals on the ground that insufficient care is taken to get them fresh. Egg-purchasing has, of course, a peculiar difficulty for the hospital authority, who must obtain large supplies of reliable eggs at the lowest possible rate. At present many institutions put out tenders for their egg-supply, making as the chief, or only, condition that the eggs shall weigh at least 2 oz. Many egg-distributors deplore this proviso, because the average pullet at its first laying season produces an egg which is just under 2 oz. in weight, but otherwise entirely satisfactory. They say that the hospitals could save money, without any deterioration in the quality of the eggs they receive, if they changed the 2 oz. standard. Mr. Gatecliff, however, maintains that at the present time many hospitals save money at the expense of their patients, and declares roundly that "the present methods of obtaining eggs for charitable institutions is not only a disgrace but a national scandal." He records a visit to a large relief institution in London, where he found that the so-called "new-laid" eggs were at least three weeks old. He relates that a large London hospital sent out tenders for first-grade British new-laid eggs and turned down a tender of 1*s.* 10*d.* a dozen as too expensive at a time when a number of poultry-farmers—between them supplying some 100,000 eggs a week—informed him that their lowest cut-price for really fresh eggs was 2*s.* 3*d.* per dozen. Mr. Gatecliff suggests as a remedy that firms of established reputation should be instructed by the hospital authority to purchase eggs at statutory market prices, thus abandoning the present system of commercial tendering. It might be interesting for the conscientious hospital administrator to investigate his egg-supply for, say, a week, and see what proportion of the eggs sent up to the wards could genuinely be classed as new-laid and suitable for the invalid. A simple test to determine the age of an egg is to drop it gently into 5 or 6 in. of water in a flat-bottomed vessel, 1 oz. of common salt having been added for each pint of water. A new-laid egg will fall to the bottom and lie flat on its side. An egg between 12 and 21 days old will settle at an angle, the broad end rising. As age progresses the angle increases, until the egg stands upright on its base. Later still, it will float upright, while the "electric egg" will float on its side on the surface. This test will not work with eggs preserved in lime or water-glass, but there are three useful guides to the preserved egg. First, the shell will crack from crown to base in boiling; this is specific. Secondly, the yolk is displaced, often touching the shell. Thirdly, the white is watery and has lost its firmness and elasticity.

If Mr. Gatecliff's accusation is justified it is a grave one; otherwise it calls for disproof. Dr. G. Clark Trotter, medical officer of health for Islington, who writes a preface to Mr. Gatecliff's booklet, initiated in our columns a correspondence [2] which revealed the difficulty experienced under the old regulations, both by the public in obtaining new-laid eggs and by the medical officer of health in ensuring that the eggs on sale in his area were properly described by the retailer. The new arrangement have long been desired by reputable egg-marketing firms, and they seem to meet the needs of our correspondents very adequately. Certainly no hospital ordering its eggs under the "national mark scheme" need fear Mr. Gatecliff's investigations, and it is surely not too much to ask that all hospital authorities should see that the food of their patients is at least as pure as their drugs.

PUBLIC HEALTH IN GUERNSEY.

THE Channel Islands have a deserved reputation for salubrious climate and other amenities. It is interesting to compare the conditions of public health with those of England and Wales and to note the problems which the local authorities have to face. The report for 1927 of the medical officer of health for Guernsey tells us that Guernsey has an area of about 25 square miles and a population just under 40,000. Its natural beauties are great, its soil very fertile, and the climate attractive, cooler in summer and warmer in winter than on the mainland. The average hours of sunshine over 34 years have been 1897. The water-supply from deep wells belongs to the Government and is "of exceptional purity." During 1927 Guernsey exported 24,509 tons of tomatoes, 3217 tons of flowers, 1165 tons of grapes and 2304 tons of vegetables. Presumably the islanders have plenty of these requisites for themselves. Most of the fruit is grown under glass. An additional export was 195,591 tons of granite for road-making. The milk herds are free from tuberculosis. The health statistics are good in part. Infant mortality is higher than in England and Wales and about double the New Zealand rate—75 for 1927. The neonatal rate, 46, was also high. The pre-school child rate was 24. On the other hand the maternal rate from childbirth is about half that of England or New Zealand. During the last 27 years there have been 24,593 births and 53 maternal deaths from childbirth—a rate of 2·15 per 1000 births. During the last two years one-seventh of the total births took place in the Lady Ozanne Maternity Home. There is no health visitation or effort to educate the mothers. At the end of 1927 arrangements were made for "part-time" school nurses. The tuberculosis death-rate is somewhat high. Granite quarrying is acknowledged to be an occupation predisposing to phthisis, owing to the presence of free silica in the rock, but one would not expect raising flowers and fruit under glass to be an unhealthy

[1] Eggs: A Treatise on their Food Value and a Helpful Guide to Securing the Genuine Article. Nov., 1928. W. Speaight and Sons, Ltd., 98, Fetter-lane, E.C.4.

[2] THE LANCET, 1927, ii., 141, et seq.

ccupation. There were eight deaths from non-ulmonary tuberculosis in 1927 and four in 1926. t would be interesting if it were possible to obtain ost-mortem examination of these small numbers of eaths yearly, in order to ascertain if the absence of ne bovine bacillus confirms the claim that the cattle re free from tubercle. The respiratory death-rate as satisfactory except for the death-rate of children nder one year, which would no doubt be improved y the work of health visitors. For years mumps as absent, but was introduced by school-boys from ngland during 1927. No cases of ophthalmia eonatorum had been notified for many years, but wo cases, both ending in blindness, occurred in 927, possibly because there were no health visitors o give the needed warning. The States have built 117 ouses since 1921 and 80 were under construction uring 1927, but Dr. Bishop would like to see baths stalled in all the new houses. At present very few ouses have baths and there is an urgent need for ublic baths. Although the water-supply is constant, here is no power to compel its being laid on to existing ouses, and this lack of proper water-supply in some f the poorer parts is a great hardship and danger. s Dr. Bishop puts it—cleanliness being next to odliness—if the islanders were as well provided ith baths as they are with churches and chapels here would be no cause for complaint. The last stalment of States houses will enable the worst um to be cleared, but Dr. Bishop shows that several f the slum tenants will not willingly leave their resent surroundings.

PROFESSIONAL ETIQUETTE.

THE recently published rulings of the General ouncil of the Bar upon doubtful points of etiquette nd conduct are of interest to other professions. wo points in connexion with advertisement are pecially dealt with. A barrister inquires if there any objection to his broadcasting a short course f popular lectures on general topics of law with the sual insertion of his name and short particulars the *Radio Times*, and the description "barrister-t-law." He also asks—with a courage which will nock the older generation of barristers strictly ained in circuit discipline—whether his photograph ay appear in the B.B.C.'s quarterly "Talks and ectures." The General Council of the Bar answers at he may broadcast the lectures as given by a barrister-at-law," but that his name, address, and notograph must not appear. Thus novel wireless evelopments have raised an old issue afresh; few arristers can have had any doubt as to how the ouncil would decide. The decision is in keeping ith the long-established principle forbidding a ember of the Bar to advertise himself by articles nder his own name on legal topics in popular journals. pecialist articles in specialist publications like the *aw Quarterly Review* are, of course, on an entirely fferent footing. The second point of this nature alt with by the Bar Council's Annual Statement for 928 is the answering of legal questions by barristers newspapers. Here the Council republishes a rmer "warning notice" which it has caused to be splayed also on the screens of the Libraries and ommon Rooms of the Inns of Court during the past ar. The notice observes that the Council's atten-on has been called to the increasing practice of gal journals advising or professing to advise their bscribers on points of law arising in actual practice. mentions a recent instance where a firm of pub-shers has offered free advice on conveyancing atters to all subscribers to one of its publications. he Council has no means of knowing whether such lvice is supplied by members of the Bar, but it lieves that in some cases the advice is represented the client as being "Counsel's opinion." It affirms its former rulings and declares unequivocally at it is contrary to professional etiquette for a rrister to answer legal questions in newspapers periodicals, whether for a salary or at ordinary legal remuneration: (1) where his name is directly or indirectly disclosed or liable to be disclosed, or (2) where the questions answered have reference to concrete cases which have actually arisen or are likely to arise for practical decision. A barrister inquired if the Council would give any further guidance by defining more narrowly the reference to "a particular question likely to arise for practical decision." Not to be drawn into hypothetical cases, the Council replied that it was a matter for the discretion of the barrister himself. That final answer counts for much in these cases of doubt. If a professional man knows that certain forms of self-advertisement are illegitimate and contrary to the accepted traditions of his fellow-practitioners he can refrain from treading close to the border-line. Every profession has its members who sail close to the wind; their colleagues know them and form their own opinion. In this matter of advising on technical questions in journals the legal profession has probably had some increased demand or opportunity lately in view of the revolution in the law of conveyancing and real property which has sent back to school again many men of long experience and adequate instruction in the older law. The medical profession is here not quite in the same position as the legal. Advice upon health is a personal matter; the patient must be seen by the practitioner, whereas in many cases a barrister might be able to give an opinion—upon the interpretation of a clause, for instance, or upon the inference to be drawn from correspondence—without an interview. Moreover, questions of health are usually more urgent than questions of legal rights; a patient may be unwilling to wait a week for the printed reply. In other respects there is no great difference between the official standards of the Bar Council and the General Medical Council. In both professions there will be members, junior as well as senior, who are a law unto themselves. The standards cannot be upheld unless they are supported by the general approval of the rank and file. If they have that approval, they are entitled to the loyal obedience of all.

CHRONIC ULCERATIVE COLITIS.

DURING the last few years a good deal of interest has been shown in the subject of chronic diseases of the colon, and several important contributions to the medical literature have appeared lately. J. A. Ryle [1] has given a good summary of the clinical aspects and relationships of the visceral neurosis known as spastic constipation or spastic colon, with its allied condition muco-membranous colitis; diverticulosis of the colon has occupied the attention of meetings of many medical societies, and a full description of its clinical features, complications, and treatment appeared in this journal last year [2]; while chronic infections of the colon formed a subject of discussion at the meetings this year both of the British and American Medical Associations. The discussion at the former [3] covered the broad ground of the flora of the fæces and the relation of the bacteria found to diseases of the bowel and of the body generally. Part of the discussion turned on the possible causes of chronic ulcerative colitis and references were made to the claims of the enterococcus or fæcal diplostreptococcus as a causative agent in this complaint; these claims were regarded as non-proven. At the meeting of the American Medical Association,[4] however, strong support of these claims was brought forward by J. A. Bargen and others. In 189 cases of chronic ulcerative colitis observed at the Mayo Clinic, Bargen had isolated in pure culture a diplostreptococcus with definite morphological, cultural, and biological properties, which he has come to regard as the ætiological agent in the disease. The strains isolated were

[1] Ryle, J. A.: THE LANCET, 1928, ii., 115.
[2] Spriggs, E. I., and Marxer, O. A.: THE LANCET, 1927, i., 1067.
[3] Brit. Med. Jour., 1928, ii., 555; THE LANCET, 1928, ii., 295.
[4] Jour. Amer. Med. Assoc., 1928, xci., 1176.

injected intravenously into 459 healthy rabbits, and in 268 rabbits reactions were observed varying from marked diarrhœa to extensive hæmorrhages and severe ulceration of the colon. Following up these observations, Bargen has attempted the specific treatment of cases of ulcerative colitis by vaccines, and more recently serum, prepared with the diplostreptococcus as antigen. He is able to report since 1924 a series of 250 cases of chronic ulcerative colitis, in which 70 per cent. were entirely free from bowel symptoms from 16 to 52 months after the beginning of treatment. This good result over a large number of cases is suggestive, and if confirmed by other workers will be a distinct advance in the treatment of the disease; but, in the discussion following Bargen's paper, the bacteriologists were not in agreement with his findings that the diplostreptococcus is so frequently associated with the disease, or the clinicians that specific vaccines and sera were so helpful. The cultures were made by smears from the surface of rectal ulcers when observed with the proctoscope, and the organism may be, therefore, only a predominant secondary infection. The diplostreptococcus, too, is found in a considerable number of healthy people, but these strains, though morphologically similar, appear to have only slight pathogenicity for animals. On culture media the organism grows either in a "smooth" colony composed mainly of diplococcal elements or short chains, or in long chains which curl up upon themselves and present a "rough" appearance. In other bacteria the "rough" and "smooth" forms show wide variations in their antigenic properties. It is possible that differences in such characters may account for discrepancies in the views of Bargen and others, and that the difficulty may be resolved by further study.

Bargen reports that at the Mayo Clinic in 1927 there were three times as many cases of chronic ulcerative colitis as in the years before 1923. Many of these must be early cases and more amenable to treatment, and it may be surmised, too, that increasing experience has developed an improvement in the non-specific therapy which is carried on side by side with vaccine and serum treatment. Careful attention to diet and building up of the strength of the patient is necessary, and bowel lavage most helpful. Surgical measures, such as appendicostomy and cæcostomy, appear to be of doubtful value. Max Einhorn has advocated treatment by flushing of the colon with the intestinal tube by the oral route, and reports three cases successfully treated.[5] A narrow tube 2½ to 3 metres in length was swallowed and fixed when the end was observed by radiographic screening to be in the cæcum. By its means 60 c.cm. of 0·5 per cent. mercurochrome or 100 c.cm. of 1 per cent. yatren solutions were instilled into the colon daily, or daily instillations of a quart of 0·05 per cent. calcium carbonate were made through the tube which was left in position and anchored by string and safety-pin to the shirt of the patient. The tube might remain in place for three weeks while daily treatment was going on before being withdrawn by the mouth.

A. F. Hurst[6] has used with excellent results over some years a polyvalent antidysenteric serum. Absence of positive findings of dysentery bacilli in these cases had led to the belief that the treatment was non-specific; but recently P. H. T. Thorlakson[7] has reported the isolation of dysentery bacilli in four out of five cases (three of Flexner group and one of Shiga type) where scrapings of the ulcer wall were taken with a sharp cutting curette. Improvement followed the use of serum prepared from the bacilli isolated.

The just estimation of the results of any method of treatment is liable to be fallacious owing to the slow evolution and relapsing character of the disease; but now that the attention of the profession is being drawn to these cases, their early recognition should improve the prognosis. The successful manageme of this complaint calls for all the skill and resourc and patience of the physician, and for whole-heart coöperation and faith on the part of the patient.

[5] Med. Jour. and Record, 1928, cxxviii., 377.
[6] THE LANCET, 1928, i., 931.
[7] Canad. Med. Assoc. Jour., 1928, xix., 656.

INFLUENZA IN GREAT BRITAIN.

AN anxious watch is being kept upon the inciden of influenza in this country, since it is only too like that the American epidemic will find its way acro the Atlantic. As the disease is not notifiable it by no means easy to decide whether this calamit is already upon us. Those who have studied th weekly reports of infectious disease in England an Wales (see page 156) will have noticed that th death-rate from influenza is slightly rising, but far the maximal number of deaths from this cau during a single week has not reached 100. This migh suggest that Great Britain is as yet free from th American infection, but unfortunately it must b noted that a considerable number of deaths hav been notified from Glasgow, where a sharp outbrea began about a fortnight ago. The *Manchester Guardia* which has collected information about the inciden of influenza in the North, reports that all the avai able accommodation in the municipal hospital Glasgow was taken up last week-end and that pne monia is becoming a frequent sequel of attack Some idea of the proportions of the epidemic may b gained from the fact that the fares taken on th tramways last Sunday were 30 per cent. below norma whilst the number of deaths in the city during th week ended Jan. 12th was 645, compared with 38 in the week before. Those attributed to influenz number 49, whilst bronchitis and pneumonia accounte for 73 and 118 respectively. The total figure for th week corresponds to a death-rate of 31·2 per 100 per annum. The information collected by the sam newspaper from Wigan, Bury, Derby, Northwic Oldham, Stalybridge, Heywood, Burnley, Buxto Preston, and Stockport reveals no abnormal outbrea of influenza at any of these centres. Dr. C. O. Stall brass, assistant medical officer of health for Liverpoo is quoted as saying that there is no evidence of an epidemic in that city at present, but that there ma be a good deal more of it than is suggested by th notification of four or five deaths a week. "Influenza, he adds, "is said to travel at about the same rate the mail. An outbreak of influenza is about due an the weather conditions are favourable to it, bu there are no indications that it has arrived yet. Attention is drawn by Dr. A. R. Erskine, medic officer of health for Abram, to the danger of th disease breaking out in industrial areas such as th coalfields, where a widespread epidemic may mak it necessary to engage extra nurses and instal foo kitchens. The risk of removing pneumonia patient from their homes cannot be forgotten, and in village where there is much unemployment and little money with perhaps a scarcity of food besides, a situatio may well arise which will severely tax the powers the public health services and of charitable organisatio

Dr. Fernand Widal, professor of internal patholog in the University of Paris and physician to the Cochi Hospital, has died at the age of 67. The agglutinatio reaction bearing his name is only one of many contr butions which medical science owes partly or com pletely to his labours, and in the domain of clinic medicine he was equally eminent.

RECOVERY OF EXPENSES BY A HOSPITAL.—A ca was heard at Colwyn Bay county court on Jan. 10th which the governors of Colwyn Bay and West Denbighshi Hospital sued a former patient for 4 guineas in respect maintenance. It was stated that this patient, who ha been injured in a motor accident and had been treated private at the hospital, had failed in a claim for compens tion. He did not appear and was not represented. T registrar ordered that he should pay £1 a month.

Modern Technique in Treatment.

Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLXXXVIII.—THE TREATMENT OF THE BROKEN NOSE.

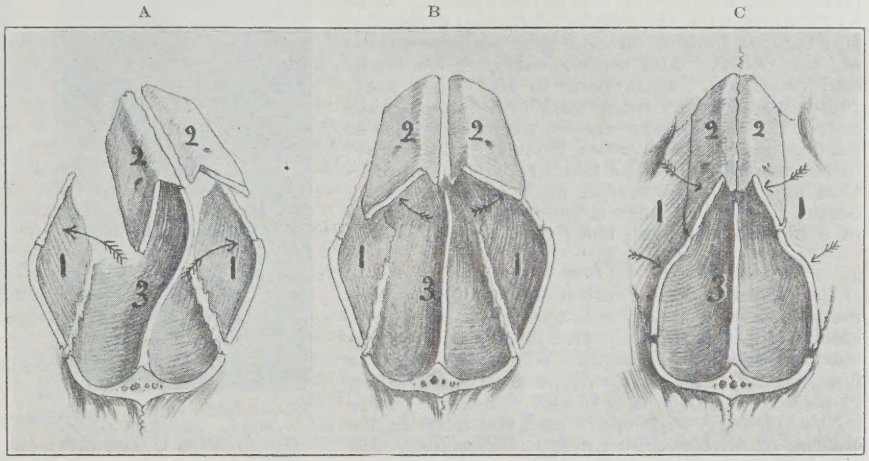
THE nose, being the most prominent feature of the face, is a very frequent site of injury. Its fracture is far commoner than the profession realises and, though it is rightly classified as a minor fracture, appropriate and prompt treatment becomes a matter of import when æsthetic and functional values are taken into consideration. Probably only a very small proportion of broken noses receives the best treatment and a more definite policy than that usually adopted is, in our experience, likely to be successful. A large percentage of traumatic septum deformities would never have to be submitted to difficult submucous resection if the broken nose were "set" adequately at once or within two or three weeks of the injury; various minor disabilities arising from bony displacement would not occur; while the resultant deformity—varying, objectively, from a slight bump or misalignment to a serious disfigurement and, subjectively, from a trivial annoyance to an overbearing inferiority complex—would be definitely avoided.

Diagnosis.

The diagnosis of the condition is not always an easy matter. By the time the nose is seen by a doctor there is usually so much swelling that the displacement is not obvious, and so much tenderness that it cannot be discerned by palpation. X ray examination is not always available or, when available, applicable with success. An antero-posterior view is useless except to give evidence of the extension or not of the fracture into the septum; in lateral views one side of the bony vault is superimposed on, and occludes the other. Although stereoscopic radiograms often confirm the suspicion of fracture, there are, as yet, no definite positions in use which give a clear conception of the complicated nature of the fracture. A small film placed on the side of the nose and exposed to a softened tube will nearly always suffice, however, to determine the presence or absence of fracture; such X ray evidence should be more easily obtainable, not so much from the point of view of guidance in treatment as for the purpose of safeguarding the profession and of encouraging the patient to submit to early corrective manipulation. Fig. 4 shows that good and instructive views can be taken.

In the absence of X ray evidence and in the presence of swelling, it is perhaps wise for the practitioner to allow the latter to subside sufficiently to convince himself and the patient of the amount of displacement and deformity present.

FIG. 2.—*Stages of Operative Treatment.*

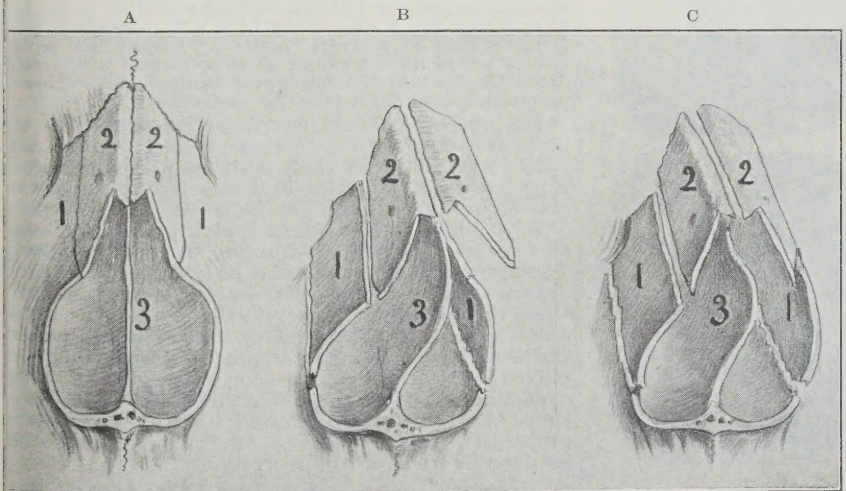


A = Frontal processes levered outwards.

B = Septum straightened and nasal bones pushed forwards.

C = Components moulded into correct position by digital manipulation.

FIG. 1.



A = Normal components of nasal arch.

B = Fracture with displacement to the left.

C = Fracture with displacement to the left and impaction on the left side.

1. Frontal process of maxilla. 2. Nasal bone. 3. Septum nasi.

Varieties of Fracture.

The type of displacement of the bony and cartilaginous components of the nose depends on the direction and severity of the blow and also on the shape and size of the striking surface. The smaller and sharper the striking surface, the more is the injury localised to the line of impact. Conversely, contact with a broad surface produces displacement and tends to cause impaction of the fragments.

There are three directions of the blow which may be usefully defined: (1) from the side and directed at right angles to the side of the bony arch; (2) from in front and received

directly on the prominence of the bridge; and (3) from below directed chiefly against the lower border of the septum. Combinations of these are common, the most usual being one from the front and side. When the blow causing this type of fracture is severe, the man in the street knows that the side of the nose receiving the blow is pushed in, the opposite side is pushed out, and the front of the nose is pushed back. More precisely, the *frontal processes of the maxilla* are fractured at their bases and at their junctions with the nasal and frontal bones, one being displaced inwards and the other outwards, both rotating on their fractured bases. The *nasal bones* are fractured from their several osseous unions and are carried as a whole in a direction continuing the line of the blow, rotating so as to produce, with the displaced frontal processes, the typical hollow on one side and convexity on the other. The *septum*, also, is fractured and displaced. It is bent in its upper part, following the bony framework and considerably narrowing the airway above, while in its lower part it is often dislocated from the nasal crest of the maxillæ. Actual fracture with comminution and even impaction or overlapping may occur, the latter most frequently as the result of a blow direct from the front.

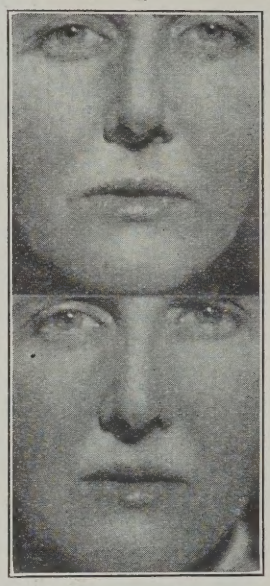
The First Three Weeks.

Preliminary cocainisation is to be recommended and general anæsthesia is advisable, ideally administered by the double-tube endotracheal method of Magill. Where the latter is not available, adequate steps should be taken to prevent inhalation of blood. The skin of the face is cleaned with spirit and the nostrils are cleared of all blood and mucus collections, and painted over with spirit or other antiseptic.

The aim of the operators should be: (1) to displace both frontal processes, (2) to disimpact both nasal bones and bring them forwards, (3) to straighten the septum, and finally, (4) to push in the frontal processes and mould the whole arch with th fingers.

Walsham's forceps, right and left, are used for manipu lating the nasal bones and frontal processes. It is we

FIG. 5.



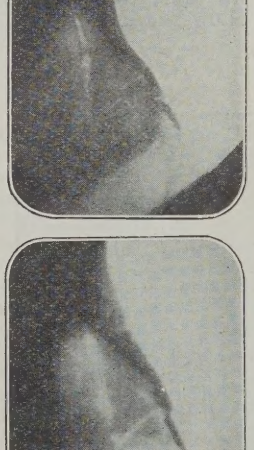
Nasal fracture with deviation to right. Result of corrective operation 17 days after injury.

The photographs (B) were take to show flattening of the lef malar region due to a con comitant fracture in thi region; they illustrate well th deviation of the bridge line an the result of operative correction

FIG. 3.

Nasal fracture with deviation to left. Result of corrective operation 23 days after injury.

FIG. 4.



Radiograms showing several lines of fracture in nasal bone. (A, by Dr. Graham Hodgson; B, by Dr. Bertram Shires.)

to cover the outer, larger blade of these forceps with rubb tubing to prevent damage to the skin. One or both of tw quite distinct actions may be employed in using the forcep Taking the left frontal process in the fracture depicted i Fig. 1 B and C in one method, the blades having been applie the instrument is rotated by the act of supination of th wrist of the operator; in the other, the wrist remains pronate and the bent elbow is raised from the operator's side, the gri of the blades on the bone being held firm throughout.

A direct, accurately aimed blow with a mastoid mall over the upper ends of the nasal bones, the skin bein protected by gauze and the eye carefully guarded, is fr quently necessary to achieve finality in mobilisation. Suc a blow requires considerable nerve and steadiness on th part of the operator.

Walsham's septum forceps are employed for straightenir the septum, the blades being passed one on each side successive grasps and twists, varying according to the typ of displacement, are made until the whole septum is sati factorily reset in a central position. Finally, the septu forceps are inclined forwards so as to elevate the liberate nasal bones, while the fingers push in the mobilised front processes behind them (Fig. 2 B and C).

The operator should not be satisfied until he ca push the nose into an overcorrected position an until it will stay in that position without support Any result short of this indicates that disimpactio and mobilisation have not been fully carried out.

After treatment consists in applying cold compresse at first and later, in instructing the patient how t massage and manipulate the nose. The latter is c definite value during the second week, especiall when there is any tendency to slight deviation whils consolidation is taking place. Firm pressure wit the thumbs on the frontal processes should be em ployed by the patient as soon as possible after th operation. After maintaining this pressure for a shor time, the thumbs are allowed to slip forwards an upwards. It is as well to advise that this shoul be done in front of a mirror.

Complications.

The only complication of note which has bee recorded as occurring before or after operation, i the formation of a hæmatoma of the septum. W

ve not ourselves met with this complication as a quel to operation; should it occur it must be relieved mediately it is discovered. Some rare cases of psis tracking upwards through the cribriform plate e reported in the literature.

Other Varieties of Fracture.

Other varieties of fracture are treated on similar nes. Where minor displacements of the nasal nes only have occurred, it is not necessary to obilise the frontal processes or to interfere with the ptum. When the nasal bones have been much mminuted by a localised heavy blow and the ighbouring part of the septum has been damaged, ution should be used in prognosis as to restoration good contour.

Fractures with Mal-union.

After the third or fourth week consolidation has ken place and the simple operative procedure out-ned above will not be sufficient to correct deformity. all old, established fractures incisions must be ade in the lateral vestibular walls, the periosteum d skin raised from the bones, and adequate saw and isel cuts made before mobilisation can be attempted. such cases, if the septum be involved, it may crack" back into correct position when the over-ing roof has been raised and the septal forceps have en applied. Many a septum that appears to emand a submucous resection can be reset in this ay. If there has been much impaction, a competent ptum operator should be asked to coöperate in is part of the operation.

H. D. GILLIES, C.B.E., F.R.C.S.
T. POMFRET KILNER, F.R.C.S.

Special Articles.

"DIPHTHERIA" IN SCHICK-NEGATIVE REACTORS.

BY R. A. O'BRIEN, C.B.E., M.D. MELB.,
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AND
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IT is generally agreed that a person reacting gatively to the Schick test has a high degree of otection against diphtheria. This view is in entire nsonance with a large body of immunological facts d principles, and is confirmed by: (1) the practical sence of the disease in specially exposed groups Schick-negative persons, such as fever nurses Benson, 1928; Harries, 1926; and Kinloch, 1927); 2) the general incidence of diphtheria in Schick-sted populations; (3) the small, but critical, xperiment of Guthrie, Marshall, and Moss (1921), ho deliberately inoculated Schick-positive and chick-negative persons with virulent diphtheria acilli and were able to produce diphtheria in the chick-positive persons only*; (4) the general xperience that Schick-negative people may "carry" irulent Klebs-Löffler bacilli in their throats for long eriods without any symptoms of local or general fection.

It must, however, be realised that the degree of immunity" in human beings conferred by any racticable method is relative. It implies the resence of a defensive mechanism which must be onsidered in strict quantitative relationship to the magnitude of the attack. A Schick-negative person is provided with sufficient diphtheria antitoxin to deal with any ordinary infection, but one can conceive that it might not be sufficient if the amount of toxin produced by the invading micro-organism is appreciably greater than the normal. The second point to be remembered is that active immunity is a function that may be subject to fluctuation, and any method of estimating it (such as, for example, the Schick test) is only fully valid at the time of the test. One has to determine by experience how permanent is the state of immunity registered by a negative Schick test.

A small percentage of Schick-negative persons relapse into the Schick positive condition, and there is obviously no a priori reason why these should not be susceptible to diphtheria. Park (1926) found 90 per cent. still immune after nine years. Parish and Okell (1928) found that of 533 children who were Schick negative on the original test made one to seven years previously, 98·9 per cent. were still clearly negative, and 1·1 per cent. showed a reaction which was read as positive. A second group of 440 children who were Schick positive on the original test were rendered Schick negative by immunisation. When retested one to seven years later 5 per cent. were found to be positive. The positives in both groups numbered 28, or 2·9 per cent. of the entire series. The further observation was made that 24 of the 28 who had relapsed to the positive state were in a state of active immunity and reacted rapidly to the minute dose of toxin used in the Schick test by producing circulating antitoxin; they became Schick negative without further prophylactic treatment. These could be regarded as able to resist an attack from the diphtheria bacillus much more efficiently than they would if they had been in a state of what might be termed virginal non-immunity. Only 4 of the 28 children (0·4 per cent. of the entire series) required immunising injections of toxoid-antitoxin. Three of the four showed a marked rise of antitoxin within one to three weeks of the injection of a single 1·0 c.cm. dose, but the fourth child failed to become Schick negative within seven weeks, and her blood contained no detectable antitoxin—i.e., less than 1/2000th unit. She was therefore in a state of non-immunity indistinguishable, during the short period of observation, from the virginal state. In the case of this child one has no reason to postulate non-susceptibility to the disease.

The question arises—do attacks of diphtheria occur in Schick-negative persons corresponding with these different degrees of immunity, and if so, how commonly do they occur and how severe are they?

The purpose of the present paper is to discuss experiences on these points that have accumulated during the last six years among a Schick-tested population which, though it cannot be exactly enumerated, may be conservatively estimated as over 20,000 Schick-negative persons. During this time a considerable number of Schick-negative persons were met with who came under suspicion as suffering from diphtheria, but in the great majority of these the diagnosis of diphtheria was not confined by clinician or bacteriologist on further examination. It is well known that the diagnosis of diphtheria, as made under the ordinary conditions of medical practice, is beset with difficulties, and the criteria which may prove useful for ordinary clinical purposes are often inadequate to establish an unquestionable diagnosis. It is necessary, therefore, to decide what criteria should be satisfied before accepting as valid both the record of the Schick test and the diagnosis.

The possible fallacies connected with the Schick test are sufficiently well known and need not be discussed in detail. The material used for the test may have been inactive owing to faulty preparation, improper conditions of keeping, bacterial contamination, or contact with antitoxin—e.g., in an insufficiently washed syringe. If these fallacies are properly guarded against by manufacturer and operator they are negligible. One can almost always conclude that

* Some years ago we had the opportunity of watching an advertent experiment bearing on the same point. Toxin mounting to some 10 to 20 human lethal doses was injected ntradermally into a known Schick-negative reactor No pecific symptoms, local or general, occurred.

in a given Schick test the material was active, owing to the record of well-marked Schick-positive reactions on subjects tested at the same time. It is possible, too, that errors may be made, by injecting at a slightly deeper level than usual, but this does not seem to affect the test seriously.

If the full 0·2 c.cm. of the Schick dose is not injected an error in the Schick reading may occur, but, in our experience, as long as the greater part of the 0·2 c.cm. dose is injected the readings obtained are sufficient for practical purposes. Errors may, of course, be made in the reading, particularly where a "pseudo" element is present, but these, again, are almost non-existent when the tests are done by an expert operator and reader. Doubt may indeed sometimes arise during reading, but the true state of immunity of the patient can almost always be determined before definitely recording him as Schick negative.

If the injections are done with reasonable care, if readings are made at the end of seven days and again at 14 days (to avoid the real risk of clerical error in recording), and if strongly positive individuals are met with when the same material is used, there is little cause for doubt as to correctness of the Schick reading. If, however, a case of alleged diphtheria should be reported in a Schick-negative person, it is necessary to inquire into all these points. It is also important to take a 5 c.cm. sample of blood at the onset of the disease and before horse antitoxin serum is given. A knowledge of the state of immunity of the patient at the time of attack can be obtained by titrating the antitoxin in the blood, or the patient may be Schick tested. (The administration of antitoxin intramuscularly three to four hours after a Schick test does not prevent the Schick toxin from producing its proper reaction.)

The question of diagnosis is a difficult one owing to the mild and often atypical character of the disease when met with in Schick-negative persons. Before we accept the diagnosis in these cases: (1) there must be sore-throat with exudate, continuous or follicular; (2) virulent diphtheria bacilli must be present in throat or nose in predominating numbers; (3) alternative causes for the condition, such as hæmolytic streptococci and Vincent's organisms, must be excluded. The virulence of the bacilli associated with alleged cases of diphtheria in Schick-negative persons must be ascertained.

The records of any isolation hospital will show that patients admitted with a diagnosis of "diphtheria" on clinical grounds are by no means invariably found to be suffering from that disease. We have, thanks to Dr. Foord Caiger and his staff, had a valuable experience of the difficulties in diagnosis. In this investigation (Caiger and O'Brien, 1924) the clinical staff of a large fever hospital arranged to coöperate at every step in a joint investigation with the laboratory workers. Approximately 436 patients certified as suffering from diphtheria and admitted to the South-Western Hospital were included in the examination. In 41 per cent. the diagnosis could not be confirmed at any period during the patient's stay in the fever hospital. In 22 per cent. of cases the diagnosis made in the admission room had to be revised in the wards.

We have, however, met with or have records of a small number of cases of diphtheria in "Schick-negative" persons, 18 in all, in which there was no serious reason either to doubt the record of the Schick reading or to question the diagnosis. The data were not equally complete in all these cases, but in a few of them we are able to make a reasonable attempt at an immunological classification.

The first type of case apparently illustrates the occurrence of a mild diphtheria in persons, once Schick negative, who had relapsed into the Schick-positive state (or whose circulating antitoxin was shown to have been low by blood titration) by the time of the onset of the disease.

CASE 16.—A nurse, three months in ward with unusual number of severe cases of diphtheria; previously immunised, passed as Schick negative 19 months earlier. Titration blood at onset of attack, 1/500th unit of antitoxin per c.c (therefore now Schick positive). Discrete "membrane" on both tonsils. Sore-throat. Virulent K.L.B. isolate Temperature normal throughout. The whole attack w considered trivial and the patient recovered rapidly witho antitoxin being given.

CASE 11.—A nurse in another fever hospital; previous recorded as Schick negative after immunisation. Titratio of blood at onset of attack showed 1/100th unit per c.c Small patch of "adherent whitish exudate." Virule K.L.B. isolated. Attack very mild, temperature norm throughout; pulse throughout below 90, patient recover rapidly without administration of antitoxin.

The mildness of these two cases and their tendenc to recovery without treatment indicate that, thoug their circulating antitoxin had fallen to a low leve their active immunity allowed them to produce ant toxin rapidly, and by their own effort to cut short th disease. These two nurses evidently belonged to th group of Schick-positive but actively immune perso studied by Parish and Okell (1928).

The second type includes those in which the patie was found to be Schick negative within 48 hours the onset of the disease (or whose circulating antitoxi was shown to be relatively high by titration).

CASE 3.—Boy aged 13 years. Tested twice and know by us to be Schick negative. Reported at night with sor throat and moderate amount of membrane on both tonsil Patient bright, no malaise or fever. Through a misunde standing—fortunately for the completeness of our invest gation—no antitoxin was given. Next morning membra practically gone, thin veil of mucus present on small pa of tonsils, temperature 98·6° F., child alert and activ Remained well and released after few days' observatio No sequelæ. Virulent K.L.B. in swab. Blood on secon day of attack contained 1/20th unit of diphtheria antitox per c.cm.; a week later three units per c.cm.

The immunological story seemed fairly clear. Th diphtheria bacilli had multiplied in the throat, pr duced a slight amount of membrane, and made toxi Any toxin entering the body cells had been imm diately neutralised by the circulating antitoxin, b had stimulated the antitoxin-producing cells make antitoxin rapidly. The child, therefore, apa from slight soreness of the throat, remained quit well.

CASE 15.—In this case we were able to secure the fu data—i.e., clinical report, virulent K.L.B. in the throa and antitoxin in the blood. "Schick test on entry negativ Four months later, on a Saturday, complained of sor throat. Seen on Sunday. Oblong strip of read ly remo able diphtheria membrane upon left tonsil. Greyish-whit Temperature normal. No malaise. Slight reddening tissue adjacent to patch of membrane. Direct sme showed morphological K.L.B. Schick test repeated. Neg tive. The girl, of course, had not been given antitoxi She is physically fit. The local condition cleared qui rapidly—that is to say, within 48 hours—of its own accord. We found virulent diphtheria bacilli in a swab from th patient, and the blood contained 1/10th of a unit of antitoxi in agreement with the Schick-negative test.

CASE 18.—A child, who had been immunised and passed Schick negative by a careful observer eight months pr viously, developed a very mild but definite attack of fauci diphtheria. A Schick test was repeated 24 hours after th onset of the disease and was negative. A blood samp for titration was not obtained. An almost pure cultu of virulent diphtheria bacilli was obtained from the fauce The child was not ill except for a slight soreness of th throat. The "membrane" rapidly cleared up witho administration of antitoxin, and the patient recovered aft a trivial indisposition.

In this class of case one would have thought tha sufficient circulating antitoxin was present to preve the development of even transient "sore-throat." One may explain the development of disease as du to a temporary failure of the patient's active immunit when confronted with an overwhelming infectio All the cases were mild and, in most, antitoxin wa not considered necessary. The patient's defence apparently rapidly and successfully recovered them selves, probably by immediately producing circulatin antitoxin. An alternative explanation is that th toxin of certain strains of the diphtheria bacillus

t entirely neutralised by the usual antitoxin pared against the Park 8 strain. There is, however, no sound evidence available in favour of the ality of diphtheria toxin, and such observations those of Okell and Parish (1926), where the toxicity 819 consecutive virulent strains was proved to be utralisable with Park 8 antitoxin, are strongly posed to this explanation.

In the remaining nine cases insufficient data were ailable for complete investigation, and we are not le to include them in either of the foregoing categories. In one of them a severe attack occurred; e patient recovered without sequelæ after antitoxin atment. It is possible that this patient corresonds with the very rare class of individuals referred above who, though once Schick negative, had apsed to a state of non-immunity indistinguishable m the virginal state, and therefore could not be pected to react to the infection by producing culating antitoxin sufficiently quickly to cut short e attack.

Discussion.

The outstanding features of these cases of "diphteria" in Schick-negative persons are: (1) their rareess, (2) their mildness in the great majority of cases. e patients appear to have the power of dealing th the infection by means of their own antitoxic fences. In the majority of instances a diagnosis s not been easy. In some cases the "sore-throat" ay have been caused by streptococci, Vincent's ganisms, &c., and the diphtheria bacilli present in e throat of the carrier may have grown in the mporarily unhealthy tissues. In the cases under nsideration we came to the conclusion that the embrane was in all probability primarily caused the diphtheria bacilli present. To a similar type case Thorne has given the term "local diphtheria" 896, p. 703). This might be taken to indicate the esence of a slight amount of membrane in the roat caused by the diphtheria bacillus, with practilly no disturbance of general health and no sequelæ. sed in the clinical sense this definition would parently fit many of the cases discussed. From the int of view of pathology there may be some objection this term. We may conceive that the bacilli ay gain a lodgment in the throat, purely extraporeally, and that any specific diphtheria toxin ade, if it is absorbed locally, is so overwhelmed by e large quantity of antitoxin present in all the dy fluids and cells, that it produces no specific imulus to the immunity mechanism of the body and, erefore, no measurable alteration of antitoxin ncentration in the blood (cf., the intradermic jection of toxin in a highly immune person). But obably the usual course is, as in Case 3; here, ough no malaise occurred, the antitoxin concentraon in the blood rose sharply. Since the toxin had early penetrated the body cells, the whole process nnot be spoken of as purely local. Though no titoxin be given, the patient recovers normal alth in two or three days and suffers from no quelæ. This sequence we might agree to call mild diphtheria," and the phrase is used throughout is paper in this sense. It is of interest that W. H. ark (1926) "has never seen an undoubted clinical se of diphtheria occur in a child who had recently ad a negative Schick reaction after a test performed y an expert."

Whatever be the true nature of these cases, which e have taken to be diphtheria in persons once known have been Schick negative, they cannot be condered to detract from the value of the Schick test. hey appear as the exception which one must expect meet in nearly every biological rule. Their very arity proves that the accuracy of the Schick test is f a very high order and that, when properly perrmed, its fallacies are unimportant. The Schick st may still be held to stand alone in depenability mong the tests for susceptibility to disease in human eings.

With regard to the problem faced by the clinician hen he sees a patient said to be Schick negative, yet with signs and symptoms justifying an unhesitating diagnosis of diphtheria, the first duty is to the patient and antitoxin should certainly be given.

Conclusions.

Patients properly tested and read as Schick negative have a high immunity and contract diphtheria only in very rare instances. Only 18 cases in which the evidence could be considered convincing were met with in six years among a Schick-negative group probably exceeding 20,000. In every case but one the disease was mild and diphtherial toxæmia in the clinical sense was absent. The mildness of the disease is ascribed to the capacity of those who have been once Schick negative to respond rapidly by the production of circulating antitoxin. In a sense, therefore, diphtheria in those who have been once Schick negative is in the great majority of cases "modified diphtheria."

Wherever diphtheria is suspected in a patient considered to be Schick negative, the virulence of the diphtheria bacilli present and the antitoxin content of the patient's blood should be investigated.

Since this note was written, an interesting paper by A. V. Neale (THE LANCET, Dec. 29th, 1928, p. 1342) has appeared; some of the data lend added emphasis to several of our points.

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MEDICAL USES OF RADIUM.[1]

SUMMARY OF REPORTS FROM RESEARCH CENTRES FOR 1927.

THIS publication is one of a series of special reports in which are recorded the results of research work done with the stock of radium salt distributed on loan to various institutions by the Medical Research Council and the British Empire Cancer Campaign. The summary here printed is based upon the accounts of work done in 1927 submitted by the several participating institutions.

The general scope of the present report does not differ very much from that of previous ones,[2] but there are unmistakable signs that radium is being more widely and confidently used in the various forms of malignant disease. A definite technique has been developed for the treatment of cancer in almost all regions of the body except the stomach.

Dosage.—In connexion with dosage the most striking thing which emerges from a retrospect of the reports is that the intensities of the radium foci have in very many cases gradually been reduced with a corresponding prolongation of the time of exposure.

For many years it was the practice to look upon tubes of radium containing as much as 20 or 30 mg. of element as the most generally useful, and the times of exposure were round about 24 hours. Now, while this may still hold for some sites, notably in cancer of the cervix uteri, it has been shown that growths affecting the buccal cavity are better treated by much less intense foci, such as tubes containing 1 or 2 mg. inserted for a week or more. At St. Bartholomew's Hospital a technique consisting of the use of weak sources with times of exposure of 10 or 11 days, has been evolved for the radium treatment of operable cases of cancer of the breast.

[1] Medical Research Council, Special Report Series No. 126. London: H.M. Stationery Office. 1928. Pp. 22. 1s.
[2] Special Report Series Nos. 90, 102, 112, and 116.

When this scheme of research was initiated by the Council in 1921, there was no technique for a single variety of cancer that was so surely established that it could be followed to the exclusion of others. Now this is no longer true. For instance, any woman suffering from early carcinoma of the cervix uteri can have the disease locally removed by means of a definitely planned course of radium treatment as surely as by surgical means; a man with a malignant growth of the tongue can likewise have the disease locally cured. In the latter case, even if the growth should have extended to the glands, radio-surgical methods would offer a good prospect of eradicating the disease. These statements, which are put forward in the report with evident conviction, spell progress. The radium therapy of cancer seems to be at that stage when the definite gains of the present will act as a stimulus to efforts in the future.

Cancer of the Breast.

The Middlesex Hospital records (1) surgical radium therapy, and (2) surface radium therapy.

(1) *Surgical Radium Therapy.*—The radium methods most frequently used in mammary cancer are supplementary to radical operation. At the time of the operation, radium in separate tubes containing 10–20 mg. of element are inserted in the intercostal spaces, supraclavicular fossa, and apex of axilla; they are left in position for 24 hours. Should visible recurrences occur, they are treated by a method which aims at encircling the growth with radium tubes. The report from this hospital contains an account of the treatment of nine cases of recurrence after operation, and in the majority of these cases the local growth disappeared. In one case where the immediate result was favourable recurrence took place in five months and "cancer en cuirasse" developed over the region of the recurrences.

(2) *Surface Radium Therapy.*—During the period under review 63 cases of breast cancer were treated including 6 of primary breast cancer, 21 of supraclavicular recurrence, and 34 of nodular recurrence. This surface radium therapy was practically all carried out by means of gamma ray applicators,[3] having a concentration of 7·5–10 mg. of radium element per sq. cm.

Such an applicator applied close to the skin often produces a slight erythema if the exposure lasts three to four hours, but if maintained at a distance of 6 cm. the time of exposure for the same effect would be about 24 hours. When the skin is intact, the aim has been to give the maximum radiation possible to the underlying primary tumour or recurrence, with the minimum skin damage. Skin damage and consequent infection has been followed by renewed growth in apparently satisfactory cases. This has been shown again lately in one of the first primary breast cases treated; after an interval of more than three years fissuring took place in a damaged area of skin and renewed growth followed.

The full exploration of surface therapy methods has been prevented by insufficient supplies of radium and by the lack of beds for the treatment of those out-patients for whom prolonged distance applications might be the best method of treatment.

At St. Bartholomew's Hospital the technique employed in treating primary carcinoma of the breast has been described in THE LANCET (1928, ii., 111). Since 1925 27 patients have been treated, all having been proved by histological examination to have carcinoma: 4 showed local improvement, but died of metastases; 12 were apparently cured; 1 was apparently cured, but died of intercurrent disease; and 10 were improving at the end of the year.

Cancer of the Uterus.

(1) *Cervix Uteri.*—Each year the statistical data contained in the reports from the different centres become more valuable, and it seems to us unfortunate that they are not recorded in exactly the same way at each of the individual hospitals. The classification of cases in three subdivisions—namely, operable, borderline, and inoperable—is followed by several of th centres, while others only adopt the first and las specification. It has nevertheless been possible t effect a grouping which provides a means of evaluatin in a general way the treatment which has been given

Statistical data have been obtained from seve centres—of which St. Bartholomew's, Universit College, and the Middlesex Hospitals have include a certain number of operable cases among thos treated, while Cardiff, Birmingham, Aberdeen, and th Medical Women's Federation have limited themselve to inoperable cases. A table shows that, whereas considerable proportion of inoperable cases remain aliv one or two years after radium treatment, this propor tion is much smaller when the interval is three o four years. The inference to be drawn from thi significant fact is either that the technique has s far improved that the results are really better tha with that adopted three or four years ago, or that, i a big proportion of inoperable cases of cancer of th cervix uteri treated on the lines specified, recurrence will occur inevitably within three or four years. the former alternative is correct, it will be prove within the next two years, when the data will b available. If the latter is true, then it is perhaps we to emphasise the fact that with some of the method which are now being extensively used there is strong probability of the recurrence of the disease within three or four years. In some, but apparentl few, centres the local treatment with radium is supple mented by means of X rays. It is rather remarkabl that this is not more often done, for the statistics some continental centres show that better end-result have been obtained when the local radium treatmen is supplemented by X rays or externally applie gamma rays. The Committee hope that some of th centres will help to decide the value of supplementar treatment.

As to technique, three main lines of techniqu are being followed at the centres, and during th period under review there have been very few change University College Hospital and St. Bartholomew Hospital record variations, while at the Gener Hospital, Birmingham, in seven cases radium wa supplemented by lead therapy, the preparation bein "choriotrope."

Interesting clinical information, often obtained a result of much very detailed clinical work, is give by St. Bartholomew's Hospital, the Medical Women Federation, and Cardiff, and is likely to be of wid use as this form of therapy becomes more genera Workers at St. Bartholomew's report that in mo inoperable patients there is no difficulty in getting ri of the growth in the uterus and vagina, but in spi of this, growth tends to continue in the deeper tissu —i.e., round the rectum—and causes strictures. is, however, by no means proved that all of the strictures are due to malignant growth, and it regarded as possible that in some they are caused b fibrous tissue. The Medical Women's Federatio discuss late radium reaction, symptoms appearin 6 to 12 months after irradiation. Pelvic and rect pain, tenesmus, and blood and mucus from th rectum are characteristics of this reaction. In seve cases there was deep rectal ulceration, and in tw fistulæ occurred. The undesirability of repeating th radiological treatment in these cases is stressed. the majority of cases, even when the reaction wa intense, the symptoms promptly subsided and th tissues rapidly regenerated. In some, repair was slo The pathogenesis of the condition is obscure. Invest gations are being carried out to find, if possible, th cause or the factors influencing its development. It attributed by the workers to the result of an obliter tive arteritis due to the irradiation, with a seconda infection of devitalised tissues. With one exceptio the rectal ulcers, including the two which produce fistulæ, were from one to four centimetres below th zone of the most intense irradiation. There was n evidence that the fistulæ were the direct result of t intense irradiation at these points. The screening h been increased in order to cut out more of the soft

[3] This means that the surface applicators used had filters attached which absorbed all but the gamma rays.

mma rays so that the injury to the superficial tissues ll be lessened without appreciably diminishing the stance dose.

The Cardiff report contains the following account of ses in which fistulæ formed :—

"Fistulæ of one kind or another developed in the course radium treatment in 13 cases (out of a total of 139); is is a high percentage, but again it has to be remembered w advanced the cases were and the likelihood of fistula rmation apart from radiation has to be borne in mind. om our clinical observations it cannot be accepted that in e majority of these cases the fistula was caused or even stened by radium."

Cancer of the Mouth, Nasopharynx, Larynx, and Œsophagus.

These sites of cancer have, during the last few ars, attracted much more attention than previously, id are, with the exception of growths in the sophagus, looked upon as distinctly hopeful for the ployment of radium therapy. Opinion still differs to the best way in which to treat a primary rcinoma of the tongue with glands probably infected ith growth. Whatever method is used, there is a nsensus of opinion that these growths respond very uch better when comparatively small quantities of dium are used and allowed to act for periods from -11 days, than when larger quantities are used for riods of 24 hours or less.

Mouth and Naso-pharynx.—At the Middlesex Hostal 30 cases of cancer of these parts were treated.

A scheme of irradiation is planned by making a scale odel in plasticine of the area to be treated and indicating e suggested positions of tubes by means of coloured pins, ch colour representing a certain size of tube. This is ken to the theatre and often affords the surgeon a useful ide to the proposed scheme. These models not only serve eir immediate purpose, but, when the patient is seen ter, it is possible to make a good comparison of the nditions before and after treatment.

At St. Bartholomew's Hospital 41 cases were treated, me of them by means of radium emanation in the rm of radon seeds. These seeds have the following dvantages :—

A small quantity of radon per seed is required, there is cutting of the tissues on insertion, they are easily retained id easily removed, and they can be used upon out-patients. ssible disadvantages are that the filtration is inadequate, ie reaction in mucous membranes is more severe than with edles, and the radon is rather concentrated.

The report states that there has been less success in ie treatment of growths arising in the tonsils than those in the other regions treated, and in fact there as been no case in which there has been apparent ire and even a temporarily satisfactory response is are.

Birmingham records the treatment of 29 cases. adio-necrosis, a late, troublesome, and very painful mplication in mouth cases, occurred in two of the ine cases where the primary reaction was severe. It nsists in a slow necrosis of the part of the alveolus ffected, and is due to the tubes being placed in too ose proximity to the bone. It is difficult adequately screen off the bone, but the condition can be revented by not giving too concentrated a dose near ie bone.

The Dublin report states that 48 cases have been eated by means of radon, the vast majority of them eing hopelessly inoperable. Special reference is ade to the beneficial value of normal saline solution the treatment of radium or X ray ulceration.

Larynx.—St. Bartholomew's Hospital reports upon ur cases of intrinsic malignant growth of the rynx, only one of which failed to respond favourably radium treatment. Of five cases which had transressed the boundaries of the larynx proper, only one efinitely improved; in this case the growth disppeared entirely, the patient remaining well for over wo years.

Œsophagus.—Previous reports, in common with hose from radium institutes in other parts of the orld, have contained nothing that could be looked pon as a hopeful or favourable method of treatment of alignant growths of the œsophagus and this still remains the position. The Middlesex Hospital and King's College Hospital report cases treated, the latter centre having evolved a development of technique.

Carcinoma of Rectum and Bladder.

Records of technique are supplied by St. Bartholomew's Hospital and Birmingham.

Sarcoma and Lymphosarcoma.

The attempt which is being made to correlate the therapeutic results of radium with the histological character of these growths makes little headway; this is largely due to the comparative scarcity of any pathological description of the cases treated and reported upon by the various centres. So far as can be ascertained, the only reports this year which include definite histological information about the growths treated are from the Middlesex Hospital, St. Bartholomew's Hospital, and the General Hospital, Birmingham.

There is no record included in the report of the technique used or results obtained in any region of the body at the London Hospital, St. Peter's Hospital, and the Royal Infirmary, Aberdeen, though these centres are mentioned in the introduction to the report among those who have been supplied with radium for research purposes.

MEDICINE AND THE LAW.

Practice by the Unqualified.

THE difference between the professional monopolies of the legal and medical practitioners is believed to be unfamiliar to the public at large. At Marlborough-street Police-court last week Mr. Mead fined a firm of auctioneers and estate agents for having infringed the Stamp and Finance Acts by drawing up an "instrument relating to personal estate" without being duly qualified. The document related to a lease. Mr. Mead held that it amounted to a deed and was therefore an infringement of the statutes which guard the legal profession's monopoly. He fined each defendant £5, ordering one of them to pay £10 costs to the Law Society who had instituted the proceedings. "I think it a great indulgence on the part of the Legislature," remarked the magistrate, "to allow persons who have had no legal training to prepare documents of a legal nature; people might suffer injustice as a result; it is like an unskilled person acting as a doctor."

There is no doubt some analogy, as the learned magistrate suggested, between the danger to property caused by unqualified persons posing as legal experts and the danger to health caused by unqualified persons posing as medical experts. But the analogy is incomplete. The unqualified person who undertakes the functions of a solicitor can be punished by law; the unqualified person who undertakes the functions of a doctor goes free. Which is the greater danger to the public?

Christian Scientists Censured for Neglect.

At a recent inquest at Doncaster upon the death of a young man of 20 from tuberculosis there was medical evidence that he might possibly have recovered with proper attention. In returning a verdict of "death from natural causes," the jury recommended that the parents be censured. The parents, who were Christian scientists, had not called in a doctor to their son. In administering a severe censure, the coroner said that they had been guilty of gross negligence; if the boy had been 15 years of age he would have advised that they should be committed for trial for manslaughter. Their belief in Christian science, he said, would have been no defence if a charge of manslaughter were brought against them.

The coroner's warning was well founded. It has long been the law that, where a legal duty exists (under statute or under contract) to look after

prisoners, children of tender years, apprentices, or helpless persons, it is manslaughter to cause death by neglect to provide the requisite food, care, and medicine. The statutory duty of parents is set out in Section 12 of the Children Act, which re-enacted earlier provisions to the same effect. Religious beliefs are no defence. This was established in 1899 in *Reg.* v. *Senior*, where the charge related to the death of an infant of 8 or 9 months from diarrhœa and pneumonia. The jury found on that occasion that the child's life would have been saved if medical assistance had been given. The father was one of that sect which declines to call in a doctor and prefers to rely on a literal adherence to verses 14 and 15 of the fifth chapter of the Epistle to St. James :—

> Is any among you sick ? Let him call for the elders of the church ; and let them pray over them, anointing him with oil in the name of the Lord : and the prayer of faith shall save him that is sick, and the Lord shall raise him up ; and if he have committed sins, it shall be forgiven him.

Mr. Justice Wills, who tried the case at the Central Criminal Court, drew the father's attention to the text : " They that be whole need not a physician, but they that are sick," but received the reply that those words were understood to apply to moral, not physical, sickness. The judge's careful summing up was referred to the Court of Crown Cases Reserved, where the observations of Lord Chief Justice Russell made it plain that the deliberate omission to call in medical aid, where necessary, for a child of tender years is not excused by the parent's peculiar religious tenets. A young man of 20, as in the recent case at Doncaster, is not a child or young person within the meaning of the Children Act ; in such a case, therefore, there is no statutory duty on the parent under Section 12. There may, of course, be a moral duty, and there have been judicial dicta, which suggested that the existence of a merely moral duty would support a charge for manslaughter.

Crime and Epilepsy.

Robert Williams, indicted for the murder of Julia Mangan, a young Irish girl, who was found beside him in Hyde Park last October with her throat cut, has been found guilty of murder at the Central Criminal Court at his second trial. The jury had disagreed at the earlier trial before Christmas. At both trials evidence was offered for the defence to suggest that Williams might have murdered the girl in a state of epileptic automatism. A witness, who knew the accused's family, said he had known five instances of insanity on the mother's side. Dr. Gordon Hume, of Fitzroy-square, who attended Williams for neurasthenia, said that in October he considered him abnormal but not certifiable. Dr. J. C. Woods, lecturer on mental diseases at St. George's and London Hospitals, said that Williams was sane when he saw him in December, but he had formed the opinion that at the time of the tragedy Williams was suffering from an epileptic mental attack. Questioned by Mr. Justice Swift at the first trial, Dr. Woods said that many people of high intelligence were going about their work although suffering from epilepsy ; he did not say they might commit murder to-morrow, but there were many who were subject to periods of automatism in which they were completely irresponsible. Dr. W. R. K. Watson, senior medical officer at Brixton Prison, said he had seen no signs of insanity or epilepsy in Williams. He saw nothing to show that Williams did not know the nature and quality of his act on the material date in October, but he could express no definite opinion, in view of the lapse of time between that date and his own examination of him. Williams's own story was that, while he was talking to the girl in the park, noises came into his head ; it seemed as if steam were coming out of the sides of his head, and as if a red-hot iron were being pushed in behind his eyes. He thought he saw Lon Chaney, the film actor, in a corner making faces at him. He did not remember taking a razor from his pocket or using it on the girl or on himself ; the next thing he remembered was a nurse washing his feet at the hospital. Aft sentencing the prisoner to death at the second tria Mr. Justice Humphreys told the jury that, in accor ance with usual practice, exhaustive inquiries wou be made by the Home Office into the allegation epilepsy. The Home Office had powers which neith judge nor jury possessed, for judge and jury we bound by the rules of evidence.

An Escaped Criminal Lunatic.

On the following day the same judge sentence a man to 15 months' imprisonment for hous breaking and theft of jewelry who was an undoubte epileptic. Dr. Watson said the prisoner had had tw fits in prison since Dec. 15th. There was evidenc of very gallant service by him at Zeebrugge and i other naval battles. He had an injury on the le side of the skull, and there might be a depresse fracture there, or a foreign body in the brain. D Watson did not think him insane. Since bein invalided out of the Navy the prisoner has had man convictions for larceny, false pretences, hous breaking, and receiving. He was certified as insan while serving his last sentence, but escaped fro Brentwood Mental Hospital. The judge observe that his present sentence would probably mean tha the prisoner would go to prison and then be sent t an asylum until the expiration of his previous sentenc It would be for the prison medical authorities t decide if he were certifiable or not.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Indications for Artificial Abortion.

FORTHCOMING reforms in the criminal code wi include many items of great interest to the medica profession. Under the present law medical men ar authorised to induce abortion only in cases wher pregnancy or birth endangers the life of the mothe For many years there has been a movement to allo them to do so when the financial or social condition the pregnant woman makes it practically impossibl to bring up the child properly. The Berlin Medica Chamber discussed this question at its recent meetin and there were many different opinions. Th Communist members proposed a resolution tha medical men should be allowed to perform abortio for social reasons and that the endeavour to preven conception should be encouraged instead of bein hindered. After a long and animated debate th Chamber turned down this resolution by a sma majority, but a motion that with the vital indicatio the social and eugenic indications should be give consideration was easily passed. The " eugeni indication " refers to cases of mental disease, epilepsy abuse of spirits or alkaloids, and also to conceptio after rape. It was stated in the discussion that i Berlin the number of normal births and abortions i about equal and that 50 per cent. of the abortions ar criminal. There are, of course, differences in variou classes and places ; according to the report of a grea Berlin sick club there were 750 abortions agains 150 normal births amongst its members. Th criminal abortions are largely explained by th shortage of dwellings and the difficulty of bringing u children owing to lack of money. The prejudic against unmarried mothers, leading to their dismissa by private employers as well as State authorities, als promotes abortion on a large scale.

Schneeberg Disease.

The Occupational Diseases Compensation Act o 1925 has attracted attention to the so-called Schneeber lung disease—a form of pulmonary cancer prevalent i workmen of the metal mines of Schneeberg in Saxony According to Prof. Saupe, of Dresden, the stone dus of the mines where the men are employed contains u to 0·5 per cent. of arsenic and has a radio-activity o

) Mache units, or more than twice that of the neigh-
›uring radium spa of Oberschlemma. No organic virus
hich can be held responsible for the disease has been
scovered. The workmen are permanently exposed
› the pernicious dust produced by drilling machines.
he clinical features of the disease are that they suffer
equently from chill and cough and from a discharge
›metimes containing blood. There is a marked
ieumokoniosis, and by and by they become weaker
ıd unable to work. Dullness to percussion is noted
. one or more regions of the lung, and a swelling of
ıe axillary and supraclavicular glands may be
›tected. The blood shows leucocytosis and eosino-
›ilia. Eventually the patients develop severe
yspnœa and cardiac insufficiency, and death
›llows a period of severe pain. Examination of the
›owths found in the lungs proves them to be cancerous,
ıd the remarkable statement is made that sometimes
vo primary growths are present in the same patient.
here is no doubt that the arsenic contained in the
›one dust, the large quantity of radium, and the hard
›nditions of work are responsible for the disease.
›chneeberg cancer develops rather slowly—sometimes
›ter 10–12 years' work in the mines. In the neigh-
›uring radium mines of Joachimsthal, Bohemia, a
milar disease is seen, but not in other mines either
ı Europe or elsewhere. Fortunately these mines,
hich were opened in the Middle Ages, are already little
orked, and there are now only about 100 miners left.

Glass Drain in the Pleural Cavity.

Dr. Relhef, a Bavarian country practitioner, has
›tely described an interesting case in the *Medizinische
Welt.* A labourer was seriously injured at his work
nd three weeks later developed an abscess on the
ght side of the thorax. On being opened this showed
connexion with the pleural cavity and a glass drain
›as accordingly introduced. Some days afterwards
ıe drain had disappeared, notwithstanding its
ccurate adjustment, and it was assumed that the
atient in his delirious stage had thrown it away.
lis condition went on improving and he was able to
›sume his work a few months after the accident. He
id so and experienced no pain during the subsequent
ine years. Then in 1927 he twice had hæmoptysis,
nd radiography showed the glass drain broken in the
›gion of the upper lobe of the lung. How it had been
roken was not ascertained, although it seems probable
hat this happened when the man was kicked by a
›orse some time ago. There is no other case on
›cord in which a glass drain has remained for so
›ng in the thorax without producing any symptoms.
ın operation is under consideration, but the patient
till withholds his consent as he has no pain from his
›oreign body.

Genital Derangements in Tobacco Workers.

Dr. Unbehann has recently published an account of
he health of tobacco workers under treatment at the
linic for women's diseases in Giessen University. He
ays that they are especially liable to disturbances and
rregularity of menstruation with severe pain. The
›rtility of these women, who mostly live in the rural
listricts of Hesse, is nearly that of the average
›opulation, but abortions are more than twice as
›mmon among them as among other women in the
ame part of the country. In three women smoking
›normous quantities of cigarettes where a pathological
›xamination of the ovaries could be performed the
›llicles showed a marked degeneration.

At the annual meeting of the German Red Cross it
vas reported that the Red Cross has 7363 local
›ranches and subsidiary societies with 1,300,000
›embers. The number has increased since last year
›y 78,000 members. There are 8000 trained nurses
›elonging to the society. First aid was given during
he year in about one million cases, and there is now
ıardly a place of importance in Germany without a
Red Cross institution.

The wife of a medical man was fined M.20 because
he drove her motor-car at a speed of nearly 35 miles an hour through a busy thoroughfare in Hamburg. On appeal she pleaded that on this particular occasion she was fetching her husband to a severely ill patient who had asked for an immediate visit. The court fined her only M.5, but regarded it as undesirable to endanger the life of several people in the hope of saving the life of a single individual.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Government Health Reports.

THE surgeon-general of the army, in his annual report, is satisfied with the health of the forces in 1927. The admission-rate for disease was 527 per 1000 ; for external causes 128. A slightly increasing rate for traumatism is attributed to more general participation in athletics and to the increasing use of motor vehicles. An increase in the annual death-rate is attributed to the occurrence of 90 cases of cerebro-spinal meningitis. The morbidity list is headed by bronchitis, tonsillitis, and gonorrhœa ; the leading cause of death was suicide, whilst the most common reasons for discharge among enlisted men were dementia præcox, constitutional psychopathic state, and mental deficiency. The director of the Veterans' Bureau reports tuberculosis as the chief cause of death, 1753 deaths out of a total of 3831 in veterans' hospitals being caused by pulmonary tuberculosis. Of the 25,899 patients remaining under treatment more than half are in hospital on account of neuro-psychiatric disability. The majority of admissions to veterans' hospitals at the present time are for disabilities unrelated to war service.

In his report for the public health service Surgeon-General Cumming states that health conditions throughout the world were generally favourable during the fiscal year 1928. Only two cases of bubonic plague were reported in North America, both contracted from infected ground squirrels in California. For the calendar year 1927 the United States recorded 34,000 cases of small-pox, a total exceeded by only one other country—namely, India. In the summer of 1927 there was a widespread outbreak of infantile paralysis. Twenty-three States reported between them 73 deaths from rabies in the fiscal year 1928. Tularæmia has now been recognised in at least 31 States and in the district of Columbia. More than 200 cases of Rocky Mountain spotted fever were reported from nine States, and the surgeon-general expresses the opinion that many more cases escaped report. A large programme of research was carried through by the Hygienic Laboratory, including research in tularæmia, undulant fever, typhus fever, and small-pox vaccination, and the standardisation of scarlet fever antitoxin. The surgeon-general asks for increased facilities for the Hygienic Laboratory and for coördination of the public health activities of the Government. A Bill to establish a National Institute of Health was introduced on Dec. 11th to the House of Representatives and referred to the Committee on Inter-State and Foreign Commerce which, under the Constitution, is the committee most nearly suited to deal with public health. This Bill not only provides for the enlargement and improved equipment of the Hygienic Laboratory, but also authorises an appropriation of a million dollars for the foundation of a new research institute. Gifts are to be invited from the American people, and the income from such gifts may be used for the establishment of research Fellowships.

Health of Pre-school Children.

The National Congress of Parents and Teachers is a powerful organisation with 20,000 units representing every economic plane. In the last three years they have sponsored a movement to ensure that the children entering school each autumn shall do so without physical handicaps. A "summer round-up"

is organised during the long summer holiday; the youngsters undergo a medical examination, and every effort is made to have the "defects" corrected. During 1927, 13,768 children were examined in this way, and the movement is apparently still growing fast. The final object is continuous medical supervision of the children from birth to school age.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 5TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 188 (last week 131); scarlet fever, 2284; diphtheria, 1333; enteric fever, 30; pneumonia, 1921; puerperal fever, 44; puerperal pyrexia, 123; cerebro-spinal fever, 8; acute poliomyelitis, 7; encephalitis lethargica, 25; continued fever, 1; dysentery, 12; ophthalmia neonatorum, 107. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 16 counties: London, 14 (Lambeth 13, St. Pancras 1); Chester, 6; Derby, 27; Durham, 24 (Jarrow 12); Essex, 7 (West Ham); Huntingdon, 3; Lancaster, 9; Leicester, 11 (county borough); Northampton, 4 (county borough); Northumberland, 20 (Tynemouth); Nottingham, 5 (Worksop); Soke of Peterborough, 3; Stafford, 4; Yorks, West Riding, 20 (Halifax 8); Glamorgan, 22 (Merthyr Tydfil 10); Monmouth, 9.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Jan. 8th–9th was as follows: Small-pox, 32 (under treatment); scarlet fever, 2075; diphtheria, 2173; enteric fever, 17; measles, 39; whooping-cough, 565; puerperal fever, 22 (plus 9 babies); encephalitis lethargica, 74; poliomyelitis, 4; other diseases, 26. At St. Margaret's Hospital there were 13 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox or enteric fever, 30 (2) from measles, 13 (4) from scarlet fever, 69 (22) from whooping-cough, 48 (5) from diphtheria, 60 (14) from diarrhœa and enteritis under two years, and 99 (18) from influenza. The figures in parentheses are those for London itself. The numbers of deaths from influenza during the previous seven weeks were 72, 49, 56, 60, 61, 69, and 83 respectively.

Liverpool reported 8 deaths from measles and Hull reported 5. Three deaths from scarlet fever occurred at Leeds, whilst whooping-cough caused 8 at Liverpool, and 5 each at Salford and South Shields. At Croydon there were 4 deaths from diphtheria, and at East Ham and Rhondda there were 3. Eight deaths from diarrhœa were recorded at Manchester, 6 at Liverpool, and 5 at Salford. Outside London the largest number of deaths from influenza was at Bristol and Liverpool (4 deaths each), whilst Plymouth Bury, Manchester, and Sheffield each reported 3. (Thirteen deaths from influenza occurred in Glasgow).

The number of stillbirths registered during the week was 258 (corresponding to a rate of 34 per 1000 total births), including 46 in London.

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

W. A. Sewell to be Hon. Surg. Comdr.

Proby. Surg. Lts. G. A. Mason and C. C. Ungley to be Surg. Lts.

INDIAN MEDICAL SERVICE.

Lt. W. J. A. Coldstream to be Capt.

Temp. Capt. Chandiram Ghurbamal Malkani relinquishes his temp. commn.

COLONIAL MEDICAL SERVICES.

Mr. A. R. Wellington (chief health officer, Federated Malay States) to be Director of Medical and Sanitary Services, Hong-Kong, and Mr. K. C. Yeo Assistant Medical Officer of Health. Mr. R. L. Cheverton, District Medical Officer (Cyprus); Lieut. S. P. Wilson, Medical Officer of Health (Gold Coast); and Mr. A. H. Lowther, Medical Officer (Straits Settlements).

Correspondence.

"Audi alteram partem."

THE TREATMENT OF EARLY BREAST CANCER.

To the Editor of THE LANCET.

SIR,—Various articles which have appeared in the last two issues of THE LANCET upon the treatment of carcinoma of the breast indicate that we have reached a critical phase in the evolution of this branch of surgery. For many years the treatment has seemed to be standardised in the form of a severe and mutilating operation which has been based on the work of Halsted and Sampson Handley. Your leading article of Jan. 12th characterises this standardisation as having been effected "at a very high level of efficiency." The technical efficiency of many surgeons has no doubt reached a very high level, but if the term "efficiency" is taken to include the end-results then the justice of your statement may be doubted. Private patients are apt to seek surgical treatment at a comparatively early stage of the disease, and the proportion of five-year survivals is admittedly fairly high. But no surgeon who has carefully followed a long series of hospital patients through the five years following operation is likely to plume himself upon the "efficiency" of his work. This healthy discontent is reflected in the contributions made by Mr. Sampson Handley and Mr. Duncan Fitzwilliams, whose opinions will command the greatest respect. On the one hand, Mr. Handley predicts "fresh triumphs" for radiology conducted on a scientific basis; on the other, Mr. Fitzwilliams seeks to escape from the mutilating operation of Halsted which has been imposed upon surgeons as a routine, and states his belief that a smaller operation is often equally good in its results. Your leading article expresses an impatience with both these views, and I should like to register my protest against the rather conservative tendency which your remarks seem to betray. It is my belief that "the whole paraphernalia of scalpels, clamps, and ligatures appertaining to a cutting operation" is indeed to be largely superseded before many years are past. The grounds of this belief will be found in the statement which I made at the International Cancer Conference last July, and in the fuller account of radium treatment carried out at St. Bartholomew's Hospital which was published in your issue of July 21st. The word "cure" in relation to any form of treatment of carcinoma of the breast can only be used with the greatest caution, but it does appear to me to be now much more nearly an established fact than a pious hope, that better results can be obtained by radiotherapy in breast carcinoma late or early, than by operation. The local operation advocated by Mr. Fitzwilliams may sometimes be called for after radium has been applied; but it seems to me to be unlikely that I shall myself ever again perform the radical operation. This position has only been reached after a careful study during five years of the results obtained in 50 patients. It rests, I believe, upon a sound basis, and is largely shared by the surgeons of the Surgical Unit with whom I have been closely associated at St. Bartholomew's.

Mr. Sampson Handley emphasises the necessity for irradiating the area surrounding the growth as well as the growth itself. This principle I have long recognised, and I have applied radium mainly to the deep surface of the tumour, its periphery, and the tissues surrounding it, as well as to all accessible areas of lymphatic drainage. The results have been remarkable, and previous experience of large numbers of operated cases has convinced me that equally good results could not possibly have been obtained by operation in the same series of patients.

A doubt might be raised by the note published by Dr. H. Chambers and Prof. Russ in your last issue recording the production of a long latent period in the

rowth of tumour cells by irradiation. The only lear inference, however, to be made is that the noculated cells in their experiments had not received *lethal* dose of X rays, such as is aimed at in the xposure to radium of a week or more which I have iven. It seems unlikely that mere latency has been roduced; for the complete clinical disappearance f a tumour has been repeatedly demonstrated, and n few instances the absence of carcinoma cells in a esidual mass of fibrous tissue has been histologically roved.

Further justification of my contention can only be btained by the passage of time. Meanwhile I believe hat the surgical profession in general will do well to econsider the position from this point of view.

I am, Sir, yours faithfully,

GEOFFREY KEYNES.

St. Bartholomew's Hospital, Jan. 14th, 1929.

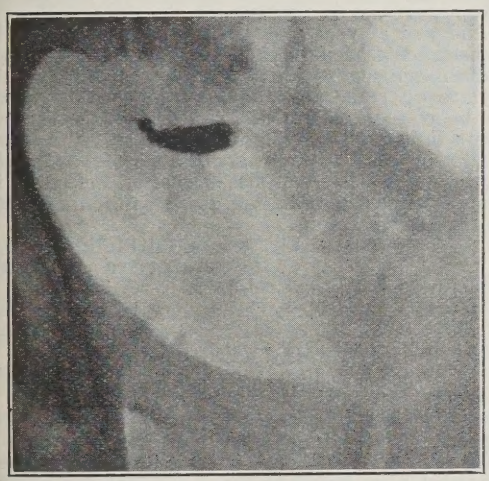
SHOT IN THE VERMIFORM APPENDIX.

To the Editor of THE LANCET.

SIR,—The interesting paper by Prof. John Fraser pon his case of Shot in the Vermiform Appendix, nd the letter from Prof. A. H. Burgess in your issue f Dec. 8th last, prompt me to record the following:—

A well-nourished man, aged 49, was sent to me in November, 1927, for radiological examination of the rinary tract, a provisional clinical diagnosis of stone in the ight ureter having been made. The examination revealed he presence of a dense elongated shadow in the right side f the pelvis. From screen examination and radiography in he recumbent position (Fig. 1) it was impossible to decide

FIG. 1.



Radiogram with patient prone.

definitely whether the shadow was produced by a stone in the lowermost part of the right ureter or by shot in the appendix. This difficulty was overcome by taking a radiogram with the patient in the upright position when it became evident that there were several pellets in the appendix (Fig. 2). On its removal, the appendix was forwarded to me by the surgeon responsible, and I was able to radiograph and otherwise examine it intact. It contained 22 pellets. Several of the pellets were incrusted with salts and were faceted so as to resemble small gall-stones in appearance; their true nature was only apparent on section. The mucous membrane of the appendix was atrophied and studded with several small discrete papillomata.

The interesting point in this case is that the patient had not recently partaken of game; indeed, he could not recollect doing so since he was a boy. It is reasonable to suppose, therefore, that the shot had been in the appendix for a considerable time; and this is borne out by the incrustation of the pellets and by the atrophy of the appendicular mucous membrane. The attacks of colic appear to have been due to attempts made by the appendix to expel the pellets en masse. The presence of the papillomata is also interesting. If I am correct in believing that the papillomata were formed as the result of irritation of the mucosa, is it not possible that they might have eventually assumed malignant characteristics?

In my experience it has not been an infrequent occurrence to find evidence of shot in the appendix

FIG. 2.

Radiogram with patient upright.

upon an abdominal radiological examination. I agree with Prof. Burgess that, in the majority of cases, the shot are probably passed by natural means; and it is questionable whether, when they are found, the appendix should be removed unless there are signs pointing to disease of that organ. This case shows, however, that shot, when present in large numbers, may become impacted in the appendix and that there is danger, in such an event, of perforation and, possibly, of malignant changes supervening.

I am, Sir, yours faithfully,

Leeds, Jan. 1st, 1929. W. H. ROWDEN.

PITFALLS IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—In to-day's issue of THE LANCET Dr. Vere Pearson mentions some of the traps that occur in the diagnosis of pulmonary tuberculosis. One of these is the question of hæmoptysis. A recent experience will illustrate the point. F., aged 50, had suffered from cough and "weak" chest for many years, and was regarded as phthisical because she had had repeated attacks of hæmoptysis. When she was seen in the spring of 1928 there was very little expectoration. Repeated examinations failed to reveal tubercle bacilli, and careful questioning showed that her "chest" attacks always commenced as a cold in the head. Investigation of her throat and nasal sinuses for a source of infection proved negative. A few days ago I was asked to see this patient, who lives in the country, with her doctor, because of a recurrence of severe hæmoptysis. She had had four attacks in the previous three days, and one was in progress on my arrival. Pulse-rate, 140; blood pressure, systolic, 160; diastolic, 100. Thinking that this would be an abnormally high pressure for her, if the condition was due to active tuberculosis, I inquired if there had been any premonitory symptoms some days before. I learned that round about Christmas she had felt poorly and could not eat. Examination of chest (brief, owing to her hæmoptysis) did not reveal much of a definite

nature, but on examining the abdomen, by palpation, I found that she was tender over the appendix and gall-bladder pyloric region. On testing a sample of the urine, it revealed acetone +++, bile +, albumin +, and what I call "leucin" bodies (? lipoid). This metabolic disturbance as a cause of hæmorrhages in various areas does not seem to have received the attention it deserves. During the past four months I have had several cases of severe epistaxis (two very severe), menorrhagia, severe hæmaturia in an old-standing pulmonary tuberculosis case during an acute allergic state, and others.

An interesting point appears in some of these cases. One of the epistaxis cases occurred after a slight operation done on the septum a fortnight before, and which had been soundly healed, and the patient returned home. Two of the menorrhagia cases had occurred in women who had been confined one or two months before, and where the lochia had been absent for weeks. It would seem as if, in those cases, there was a *locus minoris resistantiae* which decided where the hæmorrhage was to take place.

I am, Sir, yours faithfully,

R. CHALMERS, M.D., F.R.C.S. Edin.

Darlington, Jan. 12th, 1929.

THE TREATMENT OF HÆMORRHOIDS BY INJECTION.

To the Editor of THE LANCET.

SIR,—Mr. Arthur Morley's letter in your issue of Jan. 12th raises three points of interest to which, perhaps, you will be good enough to allow me to reply.

1. The question of sloughing following the injection of quinine urea hydrochloride, though a contingency which may be met with when any caustic solution is employed, is not one to which, in my opinion, undue importance need be attached. Quinine urea hydrochloride in a 5 per cent. solution is undoubtedly caustic; if it were not, its injection would not produce the reactionary fibrosis upon which the success of the treatment depends. Among the many reports of its uses is one dealing with the application of a 50 per cent. solution, applied by a spray or brush, in tonsillitis and in laryngeal tuberculosis; and though, admittedly, the conditions of submucous injection and external application are very different, one may assume that if a 5 per cent. solution is unduly caustic a solution of ten times that strength would be dangerously so. Bensaude admits that sloughing may occur, but says that the occurrence can be avoided if (*a*) one never injects an external pile or a prolapsed internal pile without first reducing it, and (*b*) if one makes one's injection as high up the rectum as possible, not in the pile mass but above it, and is careful to make the injection deeply into the submucous tissue. So far I have only had one case where sloughing occurred.

This was a lady who, four years ago, was operated on for an anal fissure and, at the same time, had had her piles dealt with surgically. When I first saw her she was suffering from marked internal piles accompanied by much hæmorrhage. A bar of fibrous tissue indicated the spot where the operation for the fissure had been performed, and at the proximal end of this bar was a freely bleeding internal pile. An injection made here was followed in three days by a sense of discomfort and fullness in the rectum. On examination a slough the size of a sixpenny-piece was visible. Further treatment was deferred for 15 days, at the end of which time the slough had separated; and, except for the three days' discomfort, the patient was no worse for the experience.

In this case the injection was made directly into the pile mass, and this fact, combined with the extensive fibrosis already present, may account for the necrosis.

2. Mr. Morley mentions that this method has been used by Dr. Tirrell and Dr. Chittenden Hill in the United States of America; but it should, I think, be made clear that both these proctologists advocate the introduction of the solution directly into the pile mass. This, at any rate, is the method explained in the last edition of Dr. Hill's book, but this book was published in 1926, and Mr. Morley may have been in communication with the author since that date. When in New York this summer I made various inquiries at the hospitals I visited, and I agree with Mr. Morley that the common practice is still the injection of carbolic oil. In my judgment, this state of affairs existed because the submucous injection by Bensaude's method was not then known. I pursued my inquiries only in New York; but no surgeon that I met was practising the method, and only one had any knowledge of it.

3. The relative value of the two antiseptics, carbolic in oil and quinine urea hydrochloride, is one on which an authoritative bacteriological opinion would be welcomed. In the absence of definite data I feel justified in questioning Mr. Morley's statement in regard to the comparative antiseptic powers of the two solutions. In a reference in Martindale (K. Taylor, li., 17, 294, 306) it is stated that quinine hydrochloride showed its greatest activity against the gas bacillus, was fairly active against the streptococcus, but little against the staphylococcus; and that the best antiseptic against the gas organism seemed to be quinine urea hydrochloride. The belief that quinine and its salts are powerful antiseptics is widely held, and if this is so one of the minor objections against the use of quinine urea hydrochloride must disappear. Mr. Morley further states in his letter that the carbolic oil solution "has the great advantage of being a powerful antiseptic and of being almost 'fool-proof' from that point of view." Is this so? Sir Lauder Brunton has said: "A solution of carbolic acid in oil is frequently used to lubricate and disinfect catheters, but Koch's experiments show that such a solution has no antiseptic power. . . ."

In the past 50 years a great many different solutions have been advocated for the treatment of this universal and distressing complaint. Amongst others, alcohol, salicylate of soda, quinine, and solutions of phenol have been recommended. Undeniably, carbolic in oil now holds the field, and in the skilful hands of Mr. Morley and others is undeniably efficacious. My opinion is that quinine urea hydrochloride is a better instrument, and time alone will show whether or not I am mistaken.

I am, Sir, yours faithfully,

CHRISTOPHER HOWARD.

Sloane-street, S.W., Jan. 14th, 1929.

ASTHMA RESEARCH.

To the Editor of THE LANCET.

SIR,—It seems to me doubtful whether the publicity campaign proclaiming that there is no cure for asthma is the best way to attract subscribers to the appeal now being issued for funds for research. In the past those unfortunate people, the asthmatics, have been treated as neurotics, and their symptoms stigmatised as nervous manifestations, and they were told they were incurable. While it must be admitted that we are painfully ignorant of the full biochemical phenomena taking place in this complaint, certain procedures have been discovered in recent years which have led to such an amelioration of symptoms as many patients are satisfied to call a cure.

Instead of reiterating the ancient parrot-cry that there is no cure for asthma, we can now encourage the asthmatic by telling him of the great advances made in treatment, and that, with few exceptions, there is hope for all. The following methods of outstanding value have each cured scores of cases: The régime of diet and exercise advocated by Dr. John Adam; the intravenous injection of peptone of Dr. Auld; the mixed coliform or entero-antigens of Prof. Danysz; the radiation of the chest of Mr. Gilbert Scott; the use of tuberculin and other work of Prof. Storm van Leeuwen; and last, but not least,

ıe dermal reactions as elaborated by Meltzer and :her American workers. Given a knowledge of the arious types of asthma, there is only one that is at esent incurable, though even that type may be elped.

Naturally, I am entirely in favour of all research hich may throw light on the problems of asthma, ut I consider the public will be more ready to ıbscribe to a venture that has paid a dividend ıd can promise more than to one which advertises s insolvency, especially when as I, for one, believe ıe latter assertion to be untrue.

I am, Sir, yours faithfully,

London, W., Jan. 12th, 1929. FRANK COKE.

MEDICAL FOUNDATIONS.

To the Editor of THE LANCET.

SIR,—In your last issue attention was directed to vo most excellent Medical Charities—namely, the oyal Medical Benevolent Fund and Epsom College. ay I bring to the notice of your readers a third, ıe Society for Relief of Widows and Orphans of edical Men, which is older than either of the two ıentioned above, having been founded in 1788 and ıcorporated by Royal Charter in 1864. The objects this Society are to help the necessitous widows ıd orphans of its deceased members, and the income the Society enables it to make substantial grants early to those in need. Membership is open to ıy registered medical practitioner who at the me of his election is resident within a 20-mile ıdius of Charing Cross; the privileges of membership re retained should a member remove outside the rea. The annual subscription is very small—2 2*s.*, £3 3*s.*, and £4 4*s.*, according to the age of the andidate.

Should any medical man, who resides within the rea, be desirous of joining the Society, I shall be very leased to send him full particulars.

I am, Sir, yours faithfully,

EDWARD J. BLACKETT, Secretary.

11, Chandos-street, Cavendish-square, W.1,
Jan 10th, 1929.

ACTINOMYCOSIS OF THE APPENDIX.

To the Editor of THE LANCET.

SIR,—I venture to question the accuracy of the iagnosis in the case reported by Dr. F. M. G. Sinclair nd Dr. S. C. Dyke in to-day's issue of THE LANCET s Actinomycosis of the Appendix. In so doing I ill not stress the pathological findings, which are otoriously difficult of interpretation in these cases nless the typical granules are found in the pus at ıme stage of the disease. I intend to confine myself ı the clinical aspect of the account.

In whatever part of the body actinomycosis may e found the pathological changes follow a very efinite series of stages. The first reaction is the ırmation of a dense, tumour-like mass which is he result of a connective tissue proliferation. Later, t various points in this mass, softening takes place ith a discharge of pus in which the characteristic ranules may be found. In my experience careful earch over a period will, sooner or later, be rewarded ı cases of true actinomycosis. In my own cases, nd in those recorded in the literature, the disease as always attacked the retroperitoneal tissues of he right iliac fossa or the muscular layers of the nterior abdominal wall. In no case within my nowledge has an infection of the peritoneal cavity ccurred at the early stage of two weeks after the ppendicectomy. It is a well-known fact that the eritoneum is extraordinarily resistant to this form of nfection and only falls to it in the final stages of the isease, when an abscess in the liver has ruptured nto the general peritoneal cavity. In my opinion he absence of any tumour-like formation, the resence of pus in large quantities within a fortnight of the original operation, and the rapid breaking-down of the wound, with exposure of the intestines, are points which negative the diagnosis of actinomycosis. On the other hand, the whole clinical history from beginning to end is typical of an ordinary pelvic abscess secondary to an acute appendix.

I have been interested in the subject of actinomycosis following acute appendicitis for some time and, in my experience, the finding of a Gram-positive streptothrix-like structure in pus from cases of acute appendicitis is not uncommon, but it is not sufficient evidence to justify a diagnosis of actinomycosis. When, in addition, the whole clinical picture is so unlike that usually found in this type of infection, then I fail to find any grounds upon which such a diagnosis can be suggested, much less maintained. The treatment of abdominal actinomycosis is fraught with so much difficulty and anxiety that I feel the diagnosis must be very certain before cases are reported as such, especially when the account contains even an implied suggestion of benefit from some form of specific treatment.

I am, Sir, yours faithfully,

R. ST. LEGER BROCKMAN.

Sheffield, Jan. 12th, 1929.

THE HEALTH OF THE YOUNG WORKER.

To the Editor of THE LANCET.

SIR,—The leading article in your issue of Jan. 12th, in which you draw attention to the gaps in the provision of medical attention for the young worker, prompts me to describe a scheme which has been for many years in force in a community of workers and their dependents. I refer to the Medical Fund of the Great Western Railway at Swindon, to which I am consulting pathologist.

The "benefits" provide for the care of an industrial population from birth to death, and comprise on the consultant staff a physician, surgeon, pathologist, and radiologist, with ten whole-time medical officers and a large (and very fully engaged) dental staff. Facilities are also provided for the customary special departments. The service is given in a hospital, a large out-patient department, and by domiciliary visits. For those who come under the National Health Insurance Act, the contracting out is arranged under the clause whereby the employee is allowed to make his "own arrangements" for medical attendance. For a few pence per week the insured person can secure for his wife, children of all ages, and other dependents all the benefits of the fund, which, incidentally, is in a very sound financial position.

It would seem that in this scheme there are not only no gaps, but the service is far more extensive than that provided under the Education and National Health Insurance Acts. Moreover, there is no official control of prescribing, or of the quality or quantity of the drugs supplied. It has also another advantage—namely, that by careful medical records it is possible to do a good deal of preventive work, and as the importance of this has been inculcated in the patients of the clinic by the medical staff, it is well recognised by members of the fund, so that, in practice, advice is sought not only for obvious disease, but for cases of indefinite illness. Another point that appeals very much to a clinical pathologist is the opportunity for research and also for consultation with one's colleagues at the bedside which is afforded. I have myself, for instance, found it possible to obtain a large amount of clinical material for almost every variety of anæmia and for obscure types of systemic infection.

It is true that we are dealing with a community which can be fairly easily served, but I suggest that a public health administration exists, not to create, but to diminish "official" difficulties and that it should not be impossible to provide continuous and effective medical treatment without "gaps" both in age and in facilities for specialist services, which exist in the

present system to which your article so aptly draws attention. I would add that the Swindon Clinic is in no sense a State medical service; it is, in fact, administered by a committee elected by the contributors to the fund, membership of which, incidentally, is not compulsory.

The advantages of eliminating the approved society in deciding how little benefit additional to the bare provisions of the Insurance Act shall be accorded to the worker, and of the continuous medical supervision from birth of the prospective worker without charity or interference by committees whose efforts may be actuated rather by emotions than by knowledge, seem to me to be inestimable. The keynote of the scheme, as it seems to me, is direct service of the worker and his dependents by a medical staff, who are independent of approved societies and State interference, and who can provide a "team" investigation and treatment of any given patient from start to finish. I imagine that this is financially possible only by eliminating administrative expenses, which have been found in practice to be quite unnecessary, but which must necessarily bulk large in any scheme administered by officials paid out of public funds.

I am, Sir, yours faithfully,

A. KNYVETT GORDON, M.B. Camb.

Bedford-square, W.C., Jan. 15th, 1929.

HISTORY REPEATS ITSELF.

To the Editor of THE LANCET.

SIR,—In Matthew Paris's "English History," Bohn Series, vol. iii., under the year 1256, occurs the following statement which bears a remarkable similarity to recent occurrences in Holborn. "About the same time, as some workmen were digging out the bed of an aqueduct at London, to clear the bed of mud (for the water had ceased to flow) a sudden explosion burst forth from the ground accompanied by a flame similar to the fire of hell, which in the twinkling of an eye suffocated several of the workmen, killing one of them on the spot, and so burning, maiming, and disfiguring others that they were entirely useless to themselves ever afterwards. There were some who said that this explosion occurred as by a miracle, because these men were engaged in servile work at an improper hour in the evening."

I am, Sir, yours faithfully,

London, Jan. 11th, 1929. R. R. JAMES.

PLEURAL PUNCTURE.

To the Editor of THE LANCET.

SIR,—As a university examiner in medicine during the last two years, I have been surprised by the fact that no single candidate to whom I have shown Potain's aspiration set has been able to assemble this apparatus; many candidates, indeed, have declared that they have never seen it before, and have no idea for what it is used. On comparing notes with other examiners, I find that their experience coincides with my own. It would appear that it has become the accepted practice to aspirate the pleural space by means of a 10 c.cm. syringe and needle. If this is really the case, I suggest that all teachers of medicine should ask themselves whether it is in the best interest of the patient that, under any circumstances, his chest should be aspirated in so perfunctory a manner. In my opinion there is only one thing to be said in favour of the syringe and needle method—it saves a certain amount of trouble. I am convinced that many empyemata go undiagnosed, sometimes till they are beyond surgical treatment, because they have been sought for in vain by the syringe and needle, whereas they would have been discovered in time had a wide-bore trocar and cannula been employed. The lumen of the needle used with a syringe is easily blocked by the thick layer of lymph which often lines an empyema cavity; moreover, the pus of the empyema may be so thick as to be difficult to aspirate through any but a wide-bore needle. If sufficient care is taken over the preliminary local anæsthesia, aspiration should be a painless operation, even when the larges cannula is employed, and it is possible, using the blun trocar, once the pleura has been penetrated, t explore the pleura with safety in various direction through one skin puncture, a manœuvre which i quite out of the question with a 10 c.cm. syringe an needle. Finally, if fluid is encountered, it is difficul to evacuate this satisfactorily by means of a syring and needle. With the Potain, or some simila apparatus, an empyema may be partially or com pletely evacuated before drainage is performed and this I believe to be sound treatment, sometime life-saving. I must apologise for occupying you space by a recital of rudimentary principles in th technique of pleural aspiration, but even if thes principles are accepted they are apparently no taught. I am, Sir, yours faithfully,

London, W., Jan. 15th, 1929. MAURICE A. CASSIDY.

THE FUTURE OF GENERAL PRACTICE.

To the Editor of THE LANCET.

SIR,—I read with great interest the leading articl on this subject in your issue of Jan. 5th. Th problem that is actually arising in general practic is the outcome of the assiduous efforts of reformer of the social system to cater for the health of th public. These persons feel that a State-administere medical service will provide for these needs. In th impoverished circumstances of the community b exploiting the doctor some attempt can be made t ensure an abundance of medical attention. Th channels through which the work is being conducte are the public health services. Originally thes departments confined themselves to the care of th public as a whole. The drainage and water-suppl was looked after. Infectious cases were followed u and isolated, not with a view to dealing with th stricken individual, but to prevent him being menace to others. The next step was in the directio of dealing with the tuberculous. A certain measur of treatment had to be provided in the attempt t stamp out the disease and prevent disseminatio This could still be considered a prophylactic publi health measure, the treatment of the individual bein justified by the fact that in curing him infection wa being checked. On the other hand, it was a com mencing incursion into the field of the practitioner medicine. The individuals of a borough paid the rates and contributed to these schemes so tha measures could be carried out because they wer prophylactic to the community as a whole.

Contrast these measures with present-day chil welfare activities, where treatment, masqueradin in the guise of prophylaxis, is given at baby clinic Is it any longer a public health service or a individual attention service, when publicly paid med cal officers have to decide whether a baby has gaine a requisite number of ounces each week, or is in th incipient stages of rickets. This is a definite attemp at State control in a certain branch of medicin and the same tendency is manifesting itself i obstetrics. If honesty was the energiser of thes schemes for prophylaxis, how is it that the firs principle of immunity, the establishment of a natur resistance by a sufficiency of food, is so easily ove looked?

Before fault is found with the system of gener practice as now conducted, measures should be taken t enhance the practitioner's clinical skill and his clinic material should not be perpetually encroached upo

Opportunity for reform is at hand in the ne De-rating Bill. The newer generation of practitione should be encouraged to have some specialty. The should be competent physicians, surgeons, obst tricians, &c., amongst them in each district. The should have held appointments at hospitals an

hould be given charge of beds in the infirmaries of he future. They should be paid adequately for his work, and the remuneration should be on a piece-ork basis. It might very well be on a relief-ticket ystem for those sick that are improvident. General ractice could still be conducted on the best lines f the past, but consulting opinion would be within all of every pocket, and the public would be educated nto realising that their family doctor was still the ound man he was, even if he had to call in the ssistance of a colleague in a branch of medicine in hich he was not specialising. This would be the air and honourable treatment for the general prac-itioner. And the patients would stand to benefit. he contact would remain a personal one still, which s undoubtedly all-important for the very best ervice.

But should a public service come, and the exploita-ion of the profession be carried to the uttermost mits to which it is now tending, the recruitment f medicine will be as successful in this country as or some of the Colonial medical services. Succeeding enerations will resist the lure of becoming underpaid xploited clinical machines, even though they might uspect themselves as being a sop in the political ame. I am, Sir, yours faithfully,

London, W., Jan. 12th, 1929. DEEPLY INTERESTED.

Obituary.

THOMAS EDWARD HOLMES, M.D. CAMB., D.P.H.

THE public health service is deprived of a capable and loyal member by the death of Dr. T. E. Holmes at the early age of 53. As medical officer for the county of Nottingham for the past five years he had borne increasing responsibilities under increasing disabilities of health, but continued to discharge his duties until almost the end of his life.

Son of the late Edward Holmes, chief constable of Leicestershire, he started his medical education at Cambridge, where he took a second class in the Natural Sciences Tripos in 1897. Thence he went on to Guy's Hospital and soon made his mark as a student. On graduating in 1900 he held a succession of appointments to the resident staff; they included that of ophthalmic surgeon, and for many years ophthalmology was of special interest to him. From London he went to Bristol, where he became assistant physician and pathologist to the Royal Hospital for Sick Children, and these and other medical experiences gave him an unusually wide basis for the public work that next received his attention. Appointed school medical officer for Nottinghamshire, he had already acted as deputy for the county M.O.H., the late Dr. Henry Handford, when his work was interrupted by the war. Holmes joined the Royal Army Medical Corps with a temporary commission, but on retiring with the rank of major returned to Nottinghamshire to his old work. On Handford's retirement he succeeded him as medical officer, after a trying period during which the county council tried to fill the vacancy by finding a candidate who would accept a salary below the usual scale. The council's attitude cannot have made the tasks of office more congenial, especially to a man of Holmes's retiring and sensitive disposition; but despite such difficulties and, later, the handicap of poor health, he was able to accomplish many of the schemes which he had planned, and his faithful work is bearing fruit in many directions.

Dr. Holmes leaves a widow with one daughter.

SIR DAVID MAURICE SERJEANT, K.B.E., M.D. ST. AND.

Sir David Serjeant, who died last Saturday, was, we believe, the oldest member of the medical profession in this country, being within a few days of his ninety-ninth birthday. The career thus closed was one of exceptional variety and interest. Born in Huntingdonshire in 1830, the son of a lawyer, Serjeant was early apprenticed to a surgeon in Peterborough, but at the age of 22 left medicine behind for the time being and set out for Australia, where he arrived in time to play in the two first inter-colonial cricket matches. Refusing settled employment, he set out for the goldfields and prospected there for a year or more, but the chances of pioneer life sent him back to Melbourne to turn his hand, after the fashion of the time and country, to all sorts of trades. In 1859 he returned to England and set his mind to medicine at Guy's Hospital, whence he qualified as M.R.C.S. and graduated at the University of St. Andrews in 1862. Joining the P. and O. service he went East again as ship's surgeon and spent many years in this employment before finally returning to England to take up practice in Camberwell. His principal work was found when he was appointed district medical officer and public vaccinator with charge of what is now St. Giles's Hospital. This post he held for a great many years, and he even returned to the practice of medicine during the late war. In 1922 he was created K.B.E.

Sir David Serjeant became medical officer to the Camberwell National Reserve in the early days of his medical practice, and claimed to be the oldest British Volunteer. He married in 1872 Helen, daughter of the Rev. Robert Dear, and had a son and three daughters, one of whom is a member of the medical profession.

WILLIAM LATIMER STOREY, M.D. R.U.I.

THE medical profession in Belfast sustains a sad loss by the death on Jan. 5th of Dr. W. L. Storey. A son of the late John Storey, J.P., of Ballmamore, County Leitrim, he was born in Quebec in 1861, and was educated at Queen's College, Belfast, graduating as M.D. in the Royal University of Ireland in 1889. His life was spent in general practice in Belfast, where he took a lifelong interest in medical societies and was for many years the energetic hon. secretary of the local division of the British Medical Association and hon. librarian of the Ulster Medical Society. To both of these he contributed various papers, some scientific, others in lighter mood, but all of them remarkable for literary style, evidence of wide culture, and a rich gift of kindly humour. Of a somewhat shy and retiring disposition he was deservedly popular with his medical colleagues, who appreciated his sound judgment, his loyal friendship, and his quick wit. He married, in 1890, Elizabeth, daughter of William Betty, of Cappy House, County Fermanagh, and she survives him with a son and a daughter.

WE regret to record the death of two brothers, ARTHUR BROWN SMITH and SYDNEY MCKENDRICK SMITH, whose work seemed to be of much promise and whose contributions to the literature of radium therapy had already begun to attract attention. Of twin birth and about 30 years of age, their careers were closely bound together. Thus, after graduating in medicine at Edinburgh in 1923, they both secured resident appointments at Addenbrooke's Hospital, Cambridge, and both studied the technique of radium treatment at Paris and Brussels and later in Sweden. In 1926 Dr. A. B. Smith took the diploma of F.R.C.S. Edin. and soon afterwards the brothers settled down in a joint practice in Harley-street, also seeing patients by arrangement in Edinburgh. A short book which they published in 1927 on "Radium in Cancer and the Surgery of Access" was useful especially because it showed the necessity for collaboration between surgeon and radiologist. Although their knowledge at this stage was necessarily derived largely from Continental authorities, there was reason to hope that increasing experience of radium would enable them to produce valuable original work. They had been for some time associated with the joint radium committee of hospitals connected with the University of Sheffield, in the capacity of honorary advisers.

Medical News.

UNIVERSITY OF CAMBRIDGE: *Pinsent-Darwin Studentship.*—Dr. R. A. McCance, of the pathological department of King's College Hospital, has been appointed to this studentship for a period of three years from Feb. 1st, 1929. His predecessor, the first holder of the studentship, was Dr. R. D. Gillespie, who has been investigating the relationships of traits of personality to psychoneuroses and the criteria for the differentiation of types of depression.

UNIVERSITY OF LIVERPOOL.—At a recent examination the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH.

R. M. Jones, J. Litt, F. R. O'Sheil, and J. T. C. Roberts.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a quarterly meeting of the Council on Jan. 10th, Sir Berkeley Moynihan, the president, in the chair, the first award of the Hallett Prize was made. In pursuance of a report from the Board of Examiners in Anatomy and Physiology for the Fellowship, regarding the result of the Primary Examination for the Fellowship concluded on Dec. 14th, this prize was awarded to Shantilal Jamnadas Mehta, M.B., of Bombay University and Middlesex Hospital. The Hallett Prize was instituted as a tribute to the services of Sir Frederic Hallett, late secretary of the Examining Board in England, during his 50 years' service with the College.

The diploma of Fellow was conferred upon James Eastwood Sykes, M.B. Liverp., Liverpool and St. Bart.'s, who has passed the requisite examinations and has complied with the by-laws.

The diploma of Member was conferred upon the following who have passed the necessary examinations: M. K. Gyi, Guy's; J. F. V. Lart, Camb. and St. Thomas's; B. W. Rycroft, St. Andrews Univ.

The undermentioned diplomas were conferred (jointly with the College of Physicians) upon the following candidates:—

Diploma in Laryngology and Otology.—M. I. Ashmawi, A. Blagoff, N. M. Eadie, M. Husnain, N. H. Meacle, H. V. O'Shea, H. M. Petty, S. Roy, E. C. Tamplin, and W. L. Thomas.

Diploma in Psychological Medicine.—R. W. Armstrong, Eileen A. Chennell, A. Craig, H. Hinchco, Phyllis M. Horton, D. L. McCullough, D. Menzies, J. E. Nicole, Muriel L. M. Northcote, Eveleen J. O'Brien, J. C. Ramsay, and C. E. Roachsmith.

POST-GRADUATE COURSE ON NERVOUS DISEASES.—A course on Diseases of the Nervous System will be held at the National Hospital, Queen-square, London, W.C., from Jan. 28th to March 22nd, consisting of 32 clinical lectures and demonstrations at 3.30 P.M. on each week-day except Wednesday and Saturday, together with teaching in the out-patient department at 2 P.M. daily (except Saturdays), and pathological lectures and demonstrations at noon on Mondays. Eight lectures on the Anatomy and Physiology of the Nervous System will be given at noon on Fridays if there are enough applicants, and 12 clinical demonstrations, chiefly on methods of examination of the nervous system, have been arranged to take place at noon on Tuesdays and Thursdays. Further information may be had from the Secretary of the Medical School at the Hospital.

BRITISH EMPIRE CANCER CAMPAIGN.—At a meeting of the Council on Jan. 14th, with the Marquis of Reading in the chair, the following were invited to become Members of the Grand Council: Mr. Malcolm Donaldson (St. Bartholomew's Hospital), Mr. R. G. Hogarth (Nottingham), Sir Ernest Swinton (Professor of Military History at Oxford), and Mr. Cecil Rowntree (Cancer Hospital).—Grants made included a sum not exceeding £2500 for cancer research at St. Bartholomew's Hospital, £150 to Prof. A. J. Clark for radiological research at Edinburgh, and a contribution of £100 towards statistical investigations by the Yorkshire Council of the Campaign.—The Grand Council confirmed the recommendation that two prizes of £500 each, with an appropriate medal, should be offered in the years 1931 and 1933 respectively for the best original piece of work carried out in the British Empire on the investigation of cancer. The prizes will be known as the Garton Prizes and Medals and the actual subjects will be chosen by the Investigation Committee of the Campaign. The competitors may be either single research workers or a team of scientists working together.—Vacancies on the Scientific Advisory Committee were filled by nominations through the Royal Society—namely, Dr. Mervyn Gordon, F.R.S., Mr. J. C. Drummond, D.Sc., and Prof. Sidney Russ, D.Sc.

HUNTERIAN SOCIETY. — The banquet to commemorate the 201st anniversary of the birth of John Hunter will be held at the May Fair Hotel, Berkeley-street, London, W., on Thursday, Feb. 14th, at 7.15 for 7.30 P.M.

THE death is announced of Dr. Henry Selfe Bennett, the last surviving son of Sir Risdon Bennett, at his residence in Upper Berkeley-street on Jan. 13th, aged 81.

ELIZABETH GARRETT ANDERSON HOSPITAL.—The Downs School, Seaford, have promised to endow a bed at the Elizabeth Garrett Anderson Hospital. The Queen will visit the hospital in the spring to open new extensions.

ANCOATS HOSPITAL.—Last year Ancoats Hospital, Manchester, treated 21,228 accident and emergency cases. With only 114 available beds 2589 in-patients were treated and to meet the demands upon the hospital at least a further 100 beds are needed.

PAY BEDS AT WESTMINSTER OPHTHALMIC HOSPITAL.—Fourteen rooms for paying patients, together with a patients' sitting-room, have been opened at this hospital. A children's department is now being prepared, the walls covered with tiles illustrating nursery rhymes.

BIRMINGHAM GENERAL HOSPITAL.—Pending the erection of a new hospital adjoining the University at Edgbaston, the governors have decided to meet the prevailing congestion by providing temporary buildings with at least 40 beds and a new casualty department on the site of St. Mary's Churchyard. A maximum of 30 beds are to be set aside for patients already admitted owing to accidents or emergencies or because the treatment they require can be given only at a general hospital and are in a position to pay for the entire cost of their treatment. A periodical census has shown that there are usually 30 such patients in the hospital, and they will now be asked to pay for their treatment and a limited fee to the member of the medical staff in charge of them.

ROYAL SALOP INFIRMARY.—In accordance with a custom dating back 182 years the annual Royal Salop Infirmary service was held in St. Chad's Church, Shrewsbury, on Sunday week. The service is held in the same week as the annual ball of the Shrewsbury Hunt Club, and it is the rule that the plates for the collection should be held by a recent Shropshire bride and a débutante at the hunt ball. This year the bride was Lady Stanier, the wife of Sir Alexander Stanier, and the débutante Miss Agnes Colville of Coton Hall, Bridgwater. Custom requires that they shall be attended by "two gentlemen of distinguished rank and fortune" in the county. This year these gentlemen were Mr. John Donaldson-Hudson, son of Lieut.-Colonel R. C. Donaldson-Hudson, chairman of the infirmary board, and Mr. Rex Holcroft, of Eaton Mascott Hall, and the collection amounted to £407. The infirmary has ended its year with a deficiency of £1200 on an expenditure of £18,800.

NATIONAL COUNCIL FOR MENTAL HYGIENE.—A series of eight lectures will be delivered in the Lecture Room of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., on Wednesdays at 5 P.M. The first three lectures on Jan. 23rd, 30th, and Feb. 13th have as group title Dangerous Ages, and are to be delivered respectively by Dr. J. A. Hadfield (Childhood), Dr. H. Crichton-Miller (Youth), and Dr. Helen Boyle (Middle Age). On Feb. 20th Dr. Letitia Fairfield will lecture on Efficiency and Deficiency, and on the 27th Dr. W. A. Potts on the Irresistible Impulse. The three concluding lectures on March 6th, 13th, and 20th will be given by Dr. Bernard Hart, Sir Maurice Craig, and Dr. C. H. Bond, the subjects being the Minor Mental Disorders of Every-day Life, the Problem of Nervous Breakdown, and the Mental Hospital of To-day. Tickets may be obtained from the secretary of the Council at 78, Chandos House, Palmer-street, London, S.W. 1.

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Subscriptions not paid in advance are charged out at the published price of 1s. per copy, plus postage. Cheques and P.O.'s (crossed "Westminster Bank, Ltd., Covent Garden Branch") should be made payable to THE MANAGER THE LANCET Offices, 423, Strand, London, W.C. 2.

Medical Diary.

Information to be included in this column should reach us proper form on Tuesday, and cannot appear if it reaches later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W.

THURSDAY, Jan. 24th.—4.30 P.M.—*The following papers will be read:* D. Denny-Brown: On the Nature of Postural Reflexes. D. Denny-Brown: The Histological Features of Striped Muscle in Relation to its Functional Activity. (Both communicated by Sir Charles Sherrington.) W. S. Stiles: The Effect of Glare on the Brightness Difference Threshold. (Communicated by Sir John Parsons.) L. J. Harris: The Combination of Proteins, Amino-acids, &c. with Acids and Alkalis. Part II., Titration Curves of Amino-acids, in presence of Formol. (Communicated by Sir Frederick Hopkins.) *The following papers will be read in title only:* F. W. R. Brambell and G. F. Marrian: Sex-reversal in a Pigeon (Columba livia). J. B. Gatenby and Sylvia Wigoder: The Effect of X Radiation on the Spermatogenesis of the Guinea-pig. (Both communicated by J. P. Hill.) J. B. Gatenby and Sylvia Wigoder: The Post-Nuclear Body in the Spermatogenesis of Cavia corbaya and other Animals. (Communicated by E. S. Goodrich.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

WEDNESDAY, Jan. 23rd.—5 P.M., COMPARATIVE MEDICINE and TROPICAL DISEASES. Special Discussion on Glanders and Kindred Diseases. Speakers: Prof. F. T. G. Hobday, Prof. G. H. Wooldridge, Dr. Minett, Mr. J. W. McIntosh, Mr. E. A. West.

THURSDAY.—8.30 P.M., UROLOGY. Paper: Sir William de Courcy Wheeler: Traumatic Rupture of the Urethra.

FRIDAY.—5 P.M., CHILDREN. (Cases at 4.30 P.M.) Cases will be shown. 8 P.M., EPIDEMIOLOGY. Discussion: Vaccination against Small-pox in the Light of Recent Experience. Openers: Dr. Ledingham and Dr. G. F. Buchan.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

FRIDAY, Jan. 25th.—8.30 P.M., Papers will be read by Dr. W. D. Nicol and Dr. G. M. Mackenzie on the Treatment of General Paralysis of the Insane by Pyrotherapy. A discussion will follow.

THE MEDICO-LEGAL SOCIETY.

THURSDAY, Jan. 24th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.) A Joint Debate between the Medico-Legal Society and the Society of Medical Officers of Health (Maternity and Child Welfare Group) on Criminal Abortion, and Measures Necessary to Reduce the Sale of Abortifacient Drugs. The Debate will be opened by Dr. F. J. McCann, who will be followed by Dr. R. A. Lyster, Sir Bernard Spilsbury, Mr. H. Beckwith Whitehouse, and Mr. H. D. Roome.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

WEDNESDAY, Jan. 23rd.—5 P.M (at St. John's Hospital, 49, Leicester-square). Dr. Goldsmith: The Acnes.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn, W.C.

MONDAY, Jan. 21st.—5 P.M., Sir Arthur Keith: The Anatomy and Evolution of the Human Brain. 4th Hunterian Lecture.

WEDNESDAY.—5 P.M., 5th Hunterian Lecture.

FRIDAY.—5 P.M., 6th Hunterian Lecture.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Jan. 21st, to SATURDAY, Jan. 26th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Lecture by Dr. Robert Hutchison: Pitfalls in the Diagnosis of Dyspepsia, on Mon., at 5 P.M.—CHILDREN'S CLINIC, Western General Dispensary, Marylebone-road, N.W. Dr. Bernard Myers: The Nervous Child in our Midst (Cases); assisted by Dr. Mackenzie Wallis. Demonstration: Method of Biochemical Examination of the Blood in Neurotic Children. Mon., at 3 P.M.—ST. MARY'S HOSPITAL, Paddington, W. Mr. Zachary Cope: Demonstration, on Wed., at 2 P.M.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Demonstration by Prof. Hugh MacLean on the Medical Treatment of Gastric and Duodenal Ulcer, on Wed., at 4 P.M. The above are free.—QUEEN'S HOSPITAL FOR CHILDREN, Bethnal Green, E. Post-graduate Course in Diseases of Children for two weeks. Further particulars from the Secretary. Telephone: Mayfair 2236.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Jan. 21st.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M. Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Jan. 24th.—4 P.M., Mr. Addison: Acute Osteomyelitis.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Jan. 22nd.—2.15 P.M., Mr. W. B. Gabriel: Fractures of the Spine with Demonstrations of Old Cases.—3.15 P.M., Dr. C. Gouldesbrough: X Ray Diagnosis of Pulmonary Tuberculosis.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Jan. 25th.—4 P.M., Mr. Andrew Wylie: Tuberculosis of the Larynx.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Jan. 22nd.—5 P.M., Dr. H. G. Adamson: Erythema Multiforme.

THURSDAY.—5 P.M., Dr. J. H. MacLeod: Ringworm Infections.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE, Manchester.

FRIDAY, Jan. 25th.—4.30 P.M. (at the Whitworth-street West Branch). Dr. Lapage: The Diagnosis and Treatment of Acute Cerebral Conditions in Children.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, Jan. 25th.—3.30 P.M., Mr. Townrow: Clinical Cases.

Appointments.

ROY, DONALD W., M.B., B.Ch. Camb., F.R.C.S. Eng., has been appointed Obstetric Surgeon to St. George's Hospital.

SAINT, J. H., M.D., B.S. Durh., M.R.C.S., Resident Medical Officer to the Freemasons Hospital and Nursing Home.

Vacancies.

For further information refer to the advertisement columns.

Birkenhead General Hospital.—Hon. Physician.

Bradford Royal Infirmary.—Two H.S.'s. Each £150.

Brighton, Royal Sussex County Hospital.—Hon. Medical Clinical Asst. Also H.S. £150.

Cardiff City Mental Hospital, Whitchurch, near Cardiff.—Med. Supt. £1000.

Charing Cross Hospital, W.C.—Asst. Physician.

Chiswick General Hospital, The Mall, Chiswick, W.—Additional Second Hon. Consulting Surgeon.

Coventry and Warwickshire Hospital.—Res. H.S. £125.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Asst. Pathologist M.A.B. Bio-chemist at the Board's Antitoxin Establishment, Sutton, Surrey. £600.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.

Great Yarmouth General Hospital.—H.S. £150.

Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.

Lancaster, Royal Albert Institution for the Feeble-minded.—Locum Tenens Jun. Asst. M.O. 8 gns. weekly.

Leigh Infirmary, Lancashire.—Res. H.S. At rate of £150.

Liverpool and District Hospital for Diseases of the Heart, 34, Oxford-street.—H.P.

Northampton General Hospital.—Hon. Pathologist.

Nottingham, City Mental Hospital.—Jun. Asst. M.O. £350.

Oxford, Radcliffe Infirmary and County Hospital.—Hon. Surgeon.

Port Said British Hospital.—Res. Asst. M.O. £350.

Portsmouth, Royal Portsmouth Hospital.—Cas. O. At rate of £100.

Princess Louise Kensington Hospital for Children, North Kensington.—Hon. Asst. Surg.

Queen's Hospital for Children, Hackney-road, E.—Asst. Surg.

Rochester, Kent, St. Bartholomew's Hospital.—H.P. At rate of £175.

Royal Army Medical Corps.—Twenty-five Commissions. £500 to £2000.

Royal London Ophthalmic Hospital, City-road, E.C.—Three Out-patient Officers. Each £100.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Clinical Asst.

Ryde, Royal Isle of Wight County Hospital.—Vacancy on Hon. Medical Staff.

Salisbury, General Infirmary.—Res. M.O. £150.

St. Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.

St. Mary's Hospital for Women and Children, Plaistow, E.—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.

St. Marylebone General Dispensary, 30, Marylebone-lane, W.—Dental Surgeon to L.C.C. School Dental Clinic.

Torquay, Torbay Hospital.—Hon. Obstetric Physician.

West London Hospital, Hammersmith-road, W.—Hon. Obstetric Registrar.

Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—H.S. At rate of £125.

Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.

The Chief Inspector of Factories announce vacancies for Certifying Factory Surgeons at Rugby (Warwickshire), Welwyn (Herts), Holmfirth (Yorks), and at Syston (Leics).

A vacancy is announced for a Medical Referee under the Workmen's Compensation Act for St. Albans, Barnet, Hertford and Watford, Circuits 37 and 38. Applications should reach the Home Office not later than Feb. 2nd.

Births, Marriages, and Deaths.

BIRTHS.

ELKINGTON.—On Jan. 10th, at Stockwell House, Bruton, the wife of Dr. Guy Elkington, of a son.

REID.—On Jan. 10th, 1929, at Burntwood, Lichfield, Staffs, to Dr. and Mrs. William Reid—a daughter.

MARRIAGES.

GOSTWYCK—DAWSON.—On Jan. 9th, 1929, at St. Mark's Church, Connah's Quay, Flint, by Rev. E. J. Davies, Cecil Hubert Gostwyck Gostwyck, M.B., F.R.C.P., D.P.M., Deputy Medical Superintendent, Rampton State Institution, Retford, Notts, son of late Lt.-Col. W. G. Gostwyck, 2nd Batt. Argyll and Sutherland Highlanders, to Brenda, youngest daughter of the late Ralph Mainwaring Dawson, of Fulwood Park, Liverpool, and Mrs. Dawson, Kelsterton Hall, Flint.

DEATHS.

BENNETT.—On Jan. 13th, at Upper Berkeley-street, W., Henry Selfe Bennett, M.B. Camb., aged 81.

BOYD-WALLIS.—On Jan. 7th, at Leas Court-mansions, Folkestone, Albert William Boyd-Wallis, M.R.C.S., L.S.A., in his 90th year.

EVANS.—On Jan. 12th, at his residence, Hampstead House, Seaford, Herbert Norman Evans, M.A., M.B. Oxf., aged 93.

HARTLEY.—On Jan. 1st, Francis William Hartley, M.R.C.S., L.R.C.P., of Heywood, Lancashire, aged 63 years.

SIMPSON.—On Jan. 11th, John Watson Simpson, M.B., Ch.B., D.P.H., of Snitterfield, Stratford-on-Avon.

WATSON.—On Jan. 4th, suddenly, at Strathearn-place, Edinburgh, Major Alexander Oswald Cowan Watson, R.A.M.C. (retired), of Carden-place, Aberdeen.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. II., 1928.

THE Index and Title-page to Vol. II., 1928, which was completed with the issue of Dec. 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

IODINE IN RELATION TO GOITRE.

BY D. W. CARMALT-JONES, M.D. LOND., F.R.C.P. LOND.,

PROFESSOR OF SYSTEMATIC MEDICINE, UNIVERSITY OF OTAGO, NEW ZEALAND; CONSULTING PHYSICIAN, WESTMINSTER HOSPITAL.

PART II.*

Goitre Incidence and Soil Iodine.

If it be true that endemic goitre depends on the poverty of the soil in iodine, then an inverse ratio should exist between the amount of iodine in the soil and the incidence of goitre in any series of districts examined. In such an investigation there are several evident sources of error. It can only be true if iodine deficiency is the only possible cause of goitre, if the iodine available for ingestion is derived exclusively from the local soil, and if perfectly uniform observations are made on all cases examined. These conditions are not realised in practice. Nevertheless, a very searching inquiry has demonstrated a remarkable association between iodine deficiency in the soil and the incidence of goitre in school-children. As stated above, over 90,000 children were examined in 33 districts, from each of which samples of soil were analysed, with about 500 analyses in all. Hercus, Benson, and Carter summarise their results as follows: "The figures for goitre incidence and soil iodine have been plotted as ordinates and abscissæ respectively . . . and a smoothed curve has been drawn through the points obtained. So closely do most of these points lie to the curve that it is apparent that an intimate connexion must exist between the amount of iodine in the soil and the incidence of goitre." A few instances only can be given here. In South Canterbury over 5000 children were examined, 62 per cent. of them had goitre, and the soil contains 4 parts of iodine per 10^7. In Taranaki, again more than 5000 children were examined; Taranaki soil contains 166 parts of iodine per 10^7, and the incidence of goitre was 7 per cent. These are the extreme cases. As an intermediate instance, Wellington soil has 40 parts of iodine per 10^7, and 25 per cent. of goitres were found in more than 2500 children. With rare exceptions, a similar inverse ratio is found throughout the country. The very difficult chemistry in these observations was carried out by Mr. C. L. Carter, M.Sc. The geological problems involved were investigated by Prof. W. N. Benson, and a single instance of the observations made must suffice. Canterbury has a very high goitre incidence; the Canterbury Plains consist very largely of river gravel with very little colloid, and contain nothing to hold soluble salts against leaching. The plains are crossed by many great rivers and the soil is very thoroughly leached; this, no doubt, accounts for the small amount of iodine in it, which is accompanied by a 60 per cent. incidence of goitre in school-children living on the products of the soil.

The establishment of this inverse ratio between goitre incidence and soil iodine is evidently of great importance in the inquiry into the ætiology of endemic goitre. It does not, however, indicate how the iodine is obtained by animals, whether by food or water, and a further research was conducted by Hercus, in association with K. C. Roberts as chemist, into the iodine content of foodstuffs raised on iodine-rich and iodine-poor soils respectively. This established that the essential iodine is normally derived from foods, though a deficiency may on occasion be made good by a water-supply which happens to contain iodine from any source such as iodine-bearing rocks or, as in the case of Lyttelton, from the sea. Such instances are, however, quite exceptional.

	Goitrous district.	Non-goitrous district.
	Iodine per kilo.	
Grass	47γ	64γ
Lettuce ..	12	24
Beef	9·5	16
Eggs	56	137

The research is of the first importance in the rational preventive treatment of endemic goitre, since it lays particular emphasis upon the minute amounts of iodine which

* Part I. appeared last week.

mark the difference between an adequate and an inadequate supply, and it is important that added iodine shall not exceed physiological needs. Specimens of all the common articles of food, obtained from goitrous and non-goitrous districts, have been assayed for iodine, and the iodine content was found to vary sometimes as 2 to 3, sometimes as 1 to 2, and occasionally even more widely. The instances shown in the above table are taken from Hercus and Roberts's paper.

It is thus seen that in ordinary rations the actual weight of iodine ingested in the two districts does not differ very widely, and the actual iodine intake per person per day has been estimated. The iodine content of the entire diet of 40 persons was estimated for a fortnight in Canterbury, a goitrous district, and also in Taranaki, a non-goitrous district. The result was surprising; in Taranaki the mean iodine intake per person per day is 35 γ, in Canterbury it is 20 γ. That is to say, the ingestion of 15 γ iodine daily makes the difference between a goitre incidence in school-children of 7 per cent. in Taranaki and 60 per cent. in Canterbury. The estimated daily requirement of iodine for the proper functioning of the normal thyroid is estimated at 30 γ.

The conclusion of this series of investigations is that endemic goitre in New Zealand is due to deficient iodine in the soil, which is reflected in deficient iodine in the food, a deficiency of such an infinitesimal amount as 15 γ daily being effective.

The Amount of the Prophylactic Dose.

This being so, the obvious prophylactic treatment of the condition is the addition of iodine to the diet, as sodium chloride is universally added. This is, of course, no new thing; what is new is the recognition of the minute amounts of iodine required. Failure to recognise it led to the breakdown of several attempts at prophylaxis in the middle of the nineteenth century. Marine and Lenhart (1917) gave school-girls 4 g. of sodium iodide over a period of ten days in two terms, with good results. Hercus and Baker (1921) gave grs. 40, 60, and 120 per annum according to age, with fair results, and without harm. These doses are immensely in excess of physiological requirements, but it appears that in the young no harm is likely to result; only so much iodine as is needed is taken up and the excess is rapidly excreted in the urine. It is otherwise with established goitres in adults, and it is of great importance that prophylactic iodine should be made universally accessible and that it should not be given in excess of physiological requirements. The obvious method seems to be the addition of iodine in suitable amounts to the common salt which has to be added to diet for very similar reasons. Several brands of "iodised salt" are on the market. That sanctioned by the New Zealand Government contains 4 parts per million of potassium iodide. The normal consumption of salt is stated to be about 6 g. per diem—that is, 6 million γ; using iodised salt this should give a daily consumption of 24 γ of potassium iodide, enough to make up the difference between the iodine intake in Taranaki and Canterbury.

Hercus has carefully investigated this method of prophylaxis for any possible bad results. He gave an enclosed population in an institution a salt containing 8 parts of potassium iodide per million. After 18 months no normal children had become goitrous, nearly 70 per cent. of the existing goitres had decreased in size, and there had been no "toxic" cases. It appears, therefore, that iodised salt, 4 parts per million, is of adequate strength and perfectly safe from any risk, and this method of administration is the nearest approach possible to the ingestion of food of natural adequate iodine content.

The Graver Manifestations of Iodine Deficiency.

Simple goitre is the adaptation of the thyroid gland to a particular environment in which the element iodine is not present in adequate amount. The adaptation made may be sufficient to preserve health and no consequences may ensue except a certain unsightliness, but it is also possible that the increase in size may be so great as to cause pressure on important structures, chiefly the trachea. But when a goitre is present there is always the risk of thyroid function being changed, either to excess or defect, so that both hyperthyroidism or "toxic goitre" and hypothyroidism or "myxœdema" may occur. The sequence of events in these conditions and the associated histological changes in the thyroid have been closely studied by Drennan. A normal thyroid is not a uniform structure; parts of it are "hyperplastic," a state called by some observers "active secretory," and other parts are "colloid," resting or storing. The hyperplastic parts are producing and issuing hormone, while the colloid parts lay up a store containing iodine which acts as a reserve during periods of stress or temporary deprivation of iodine. When iodine is not supplied in sufficient amount the thyroid responds to this stress both by hyperplasia, actively secreting without storage, and by increased colloid, increasing the size and number of its alveoli and filling these with colloid at a low iodine concentration; either condition may preponderate. This is the normal response of the thyroid to deprivation of iodine and may be present histologically without any change visible to the naked eye. It has to be considerably advanced before an actual "goitre," *guttur tumidum*, can be detected. A goitre may be called "hyperplastic" or "colloid," but both conditions are to be found somewhere in the gland. Further, the enlargement is not necessarily uniform; isolated masses of either hyperplastic or colloid tissue may occur and are generally called "adenomata." When these changes have occurred there is great liability to hæmorrhage, cyst formation, fibrosis, or atrophy. Drennan recognises three possible variations when the normal thyroid is deprived of iodine: (1) diffuse colloid enlargement, (2) nodular enlargement, and (3) diffuse hyperplasia.

Probably the goitres found among school-children are chiefly in the stage of diffuse colloid enlargement. Many of these are curable by iodine, and revert fairly rapidly to normal; they take up as much iodine as they require and reject any excess, without showing toxic symptoms. In older persons any excess of iodine in treatment is liable to induce toxic symptoms—tachycardia, sweating, nervousness, and possibly exophthalmos. Toxic symptoms do not always or necessarily occur, but they do sometimes, and there is a risk of them. Many forms of stress make heavy demands on the thyroid; menstruation and pregnancy produce actual enlargements, though not great ones, and probably such strains as those induced by university examinations and the like act similarly in young adults. If any excess of iodine be given to a person whose thyroid is accustomed to function with a small allowance of iodine at a time when a heavy demand is being made upon it, toxic symptoms may be produced, presumably because material is supplied for the production of an excess of thyroxin.

Some thyroids become toxic without any excess of iodine; how that comes about is not clear. Iodine treatment may cure diffuse colloid goitre, but iodine in excess may induce toxic symptoms, and that is why prophylactic iodine in salt must be kept down to the irreducible minimum. Much the same is true of the nodular enlargement; on the whole, nodular enlargements more frequently show toxic symptoms, "toxic adenoma," and often take the more serious form of Graves's disease. The actual amount of thyroid tissue present in any given case is an important factor in the precipitation of toxic symptoms. On the other hand, the adenomata are also liable to atrophy and hypothyroidism, up to complete myxœdema. It is perhaps questionable if the condition of diffuse hyperplasia results from iodine deficiency, but there are cases which support it. These are the cases which have shown no goitre until well into adult life. It is suggested that up to that time they were able successfully to compensate for iodine deficiency without visible enlargement. They suddenly develop goitre, with toxicity and often exophthalmos, and constitute "primary Graves's disease." This is not infrequent at the menopause in women, and it may be that when the demand for thyroid activity is thus stopped the thyroid produces a relative excess of thyroxin which induces the toxic symptoms.

"Toxic goitre" is an exceedingly difficult subject. Every case of goitre submitted to stress does not become toxic, and it is not suggested that its occurrence is wholly to be explained by deprivation or excess of iodine, but there are undoubtedly cases in which toxic symptoms may be induced by iodine, so that the greatest care is necessary in its use. A few instances may be recalled in which the exhibition of iodine was followed by toxic symptoms in cases of goitre.

CASE 1.—A woman medical student, with a simple goitre, when working at high pressure in her fourth year of study, was given potassium iodide, grs. 15, thrice daily for the goitre. Graves's disease, ultimately requiring partial thyroidectomy, rapidly supervened.

CASE 2.—A male medical student, aged 23, with a large soft goitre, took grs. 200 of potassium iodide in nine months, rather less than a grain a day. At the end of this time the goitre had disappeared, but tachycardia, tremors, and exophthalmos were present, which subsided in several months without operation.

CASE 3 (by courtesy of Dr. Frank Fitchett).—The chest of a patient with goitre suffering from pleural effusion was painted by tr. iodi, and toxic symptoms supervened.

CASE 4 (also Dr. Fitchett's).—A patient suffering from obesity, which concealed a goitre, received potassium iodide in the prescriptions, and intense hyperthyroidism was induced.

Dr. Fitchett has also reported three cases of students from a ladies' college who showed signs of hyperthyroidism after the introduction of iodised salt having the strength of 1 part of potassium iodide in 5000 (50 times the strength now authorised by the New Zealand Government).

The iodides are drugs in common use in the treatment of bronchitic and rheumatic conditions; the question arises

how far their prescription may be responsible for the induction of toxic symptoms in cases of goitre.

The ætiology of endemic goitre in New Zealand is believed to be understood, and it is also believed that when the profession and the public fully realise the position it will be prevented. Toxic goitre is a far more difficult matter, and these remarks are only an attempt to apply the knowledge which exists about simple goitre to the toxic problem.

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PLASMOCHIN IN MALARIA AND BLACKWATER FEVER.

Dr. Drenowsky[1] has found plasmochin useful in treating malaria in country practice in Bulgaria; it has not the unpleasant taste of quinine, does not cause ringing in the ears or headache, and though in the treatment of 209 cases it did cause—in adults, and about the fourth or fifth day—diarrhœa five times, blueness of the lips and gums three times, and vomiting once, these unpleasant symptoms passed quickly away when administration of the drug was stopped. It is issued in the country districts in Bulgaria by the "quinine distributors," who are taught to give plasmochin to tertian and quartan cases, but plasmochin compound (plasmochin 0·01 g., with 0·125 g. quinine) to subtertian patients, the dose of plasmochin never to exceed 0·01 per kg. of body-weight. This works out at about grs. 10 for a man of 10 st. They must also themselves put the dose into the mouths of the patients, and watch for and report any unpleasant sequels. Good results are claimed. Treatment is given for six days after which the blood is again examined. Should the cure be incomplete, treatment is repeated for six to eight days, and after a five-day pause another course may be given if required. The swelling of the spleen quickly diminishes. Of the 209 cases above-mentioned, three-quarters were said to be cured (of tertian 81, of quartan 61, of subtertian 50 per cent.). Chronic carriers can most hopefully be tackled in winter, when 80 to 90 per cent. of successes are claimed. Four cases of blackwater fever all recovered, pyrexia being lost in three days, hæmaturia in five. Gravid women, Dr. Drenowsky says, take plasmochin without harm, a very important matter, and the drug is useful in the malarial diarrhœa of children. As there are quinine-resisting parasites, so some resist plasmochin. Dr. P. Talianidis reports[2] on the 80 cases of blackwater fever he has treated at Salonica among the refugees during four years ending in December, 1927. Cases appeared mostly in autumn and January—i.e., in the subtertian season. The disease was most often seen in hard-working, poorly fed men, particularly those who took quinine irregularly. He has most confidence in plasmochin in treatment. Of 14 patients treated with this drug, only two died, whereas 21 died in a series of 30 who were given quinine.

CHOCOLATE AND COCOA.

Messrs. Cadbury Bros., Ltd., have this year produced chocolates in several new assortments additional to their well-known brands. From the novelties the firm, it appears, caters for those who like hard centres by an assortment under that name, while for those who prefer soft centres there are other kinds. The samples sent to this office include also specimens of the new chocolate sandwiches in convenient packages, and of Bournville Cocoa. All these delicacies are produced under hygienic conditions, and are known to our readers to be of high quality, while nutritional value has been always under consideration.

LANE'S SCHOOL OF ANATOMY.[3]

ALL familiar with the story of medical education, as the early attempts towards standardisation became effective at the end of the eighteenth century, know the prominent part that was played, especially in London, by the private

(*Continued at foot of next column.*)

[1] Arch. f. Schiffs-u. Trop.-Hyg., 1928, xxxii., 575.
[2] Ibid.
[3] The School of Anatomy and Medicine adjoining St. George's Hospital. By R. R. James, F.R.C.S. Privately printed. 1928. George Pulman & Sons.

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 112.*)

THE following is the text of the official bulletins which have been issued during the past week and signed by Sir Stanley Hewett and Lord Dawson of Penn:—

WEDNESDAY, JAN. 9TH. 8.15 P.M.

The King has had a quiet day. The local conditions make steady progress and there is a slight increase of strength. No further bulletin will be issued till to-morrow evening. (Signed also by Sir Hugh Rigby.)

THURSDAY, JAN. 10TH. 8.15 P.M.

The King has passed a quiet day and there is no change to report in His Majesty's condition. The next bulletin will be issued to-morrow evening.

FRIDAY, JAN. 11TH. 8.15 P.M.

The King has had a restful day. There is no change to report in His Majesty's condition. The next bulletin will be issued to-morrow evening.

SATURDAY, JAN. 12TH. 8.20 P.M.

The King has had another restful day and otherwise the condition of His Majesty remains unchanged. The next bulletin will be issued on Monday morning next.

MONDAY, JAN. 14TH. 11.30 A.M.

His Majesty is making slow progress. The next bulletin will be issued to-morrow evening. (Signed also by Sir Hugh Rigby.)

TUESDAY, JAN. 15TH. 8 P.M.

The King has had a quiet day. The progress previously noted, though slow, continues. The next bulletin will be issued on Thursday morning.

(*Continued from previous column.*)

schools of anatomy. The last of these institutions, popularly known a hundred years ago as "Lane's School," has been now made the subject of an interesting note by Mr. R. R. James, ophthalmic surgeon to St. George's Hospital, the institution with which the school was specially connected. The school was founded by Mr. Samuel Armstrong Lane, a pupil at St. George's Hospital, of Sir Everard Home in 1830, and it continued to exist in a fairly flourishing condition until 1854. It was in some respects the lineal descendent of the school in Great Windmill-street, honourably associated with the names of the two Hunters, Matthew Baillie, James Wilson, Benjamin Brodie, and Cæsar Hawkins, among others. This institution came in some way under the management of Lane, when it was transferred to Grosvenor-place to meet the needs of the students of St. George's Hospital, but almost contemporaneously an anatomical school was started within the hospital, so that there were, for a period, two schools existing within a few yards of each other. Mr. James's pamphlet, several chapters of which have appeared at times in the *St. George's Hospital Gazette*, is especially interesting in the light that it throws on the violent bickering that was quite usual among hospital staffs in those days. It would seem, from Timothy Holmes's "Life of Sir Benjamin Brodie," that at the Great Windmill Street School Brodie had been the pupil of James Wilson, while the son of James Wilson became associated with Lane in starting the anatomical school in Grosvenor-place. This was unfortunate for Lane, as inimical relations existed between Brodie and the son of his former master, and a bad understanding with the all-important Brodie affected Lane's chances of being elected upon the staff of St. George's Hospital. How this resulted in the transference of Lane's school to the new St. Mary's Hospital is explained in Mr. James's interesting chapter on medical history. He gives us a picture of hospital life and medical training as they existed up to the middle of the nineteenth century which bears no resemblance to anything any living practitioner can remember, and once again demonstrates how closely associated the medicine at the beginning of the nineteenth century was with that of the eighteenth century, and how complete the transformation in views and practice was which followed rapidly upon the vast medical progress dating from 1850.

An Address

ENTITLED

SORE FINGERS AND SUCH TRIVIALITIES.

Delivered before the Liverpool Medical Institution

BY R. KENNON, M.D. LIVERP., F.R.C.S. ENG.,

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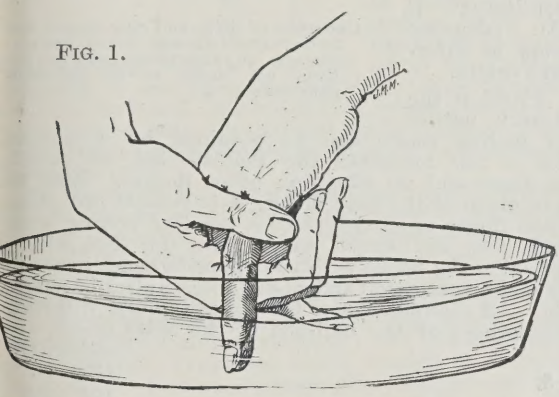
The hangnail, the thorn-pricked hand of the gardener, the needle-prick of the seamstress or surgeon, and the bites of the gnat, lesions too trivial to figure in examination papers, are too often a nightmare in our practices. It is no exaggeration to say that in any large city many valuable fingers are amputated for gangrene which have never been infected. These and others permanently crippled

FIG. 1.



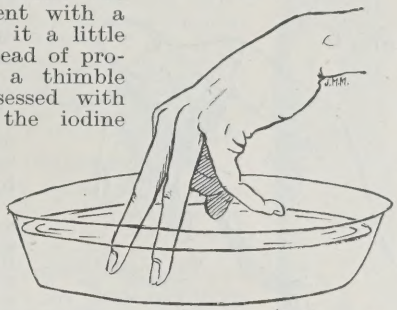
The usual method of soaking a finger, the nail-bed tenderness of the opposite little finger is diagnostic.

might have been saved by a better appreciation of the usual reaction to injury and a knowledge of the destructive action of antiseptics, hot fomentations, and squeezing in search of non-existent pus.

I am not concerned with the infected finger but with its antecedents—the reaction to injury. It is rare for a serious infection to supervene upon the pricked finger of the gardener or in the poor child with a hospital dressing trailing in the mud as he hobbles home with a cut foot. In conformity with modern first-aid knowledge both will have had the wound washed. Experience will show that wounds kept dry suppurate less frequently than those kept moist, so a liberal application of any mild spirit preparation, such as tincture of iodine, may complete the treatment. Some quickly forget their injuries, but doctors, nurses, and the more educated lay people are all too ready to imagine that the thorn or needle has carried germs into the depths, so a vigorous squeeze initiates treatment, to make the part bleed and wash back the organisms. A moment's thought would show that it would be just as sensible to try to squeeze water out of wet socks without first removing the boots. This treatment can only disseminate the organisms beneath the skin, and, by further injuring the tissues, provide a nidus of extravasated blood wherein bacteria may multiply in security from the surrounding lymph and its protective qualities. *Squeezing for pus*, once started, becomes a hobby of patient and practitioner whenever they look at the finger. It is quite easy to recognise such maltreatment in a progressively tender finger: (1) by the circular line of demarcation between the healthy and the congested area; and (2) by the almond-shaped patch of congestion where pinching has been the continuing trauma. I have seen boils on the more accessible parts of the body so strenuously pinched that a black patch of gangrene the size of a sixpence had appeared; if to this a really hot fomentation is added a crop of vesicles will form and so simulate anthrax as closely as vaccinia. In a museum of public health a few years ago there figured a coloured illustration labelled "Anthrax, organisms not found." I wonder how many boils are so treated.

Twelve hours after the injury the patient with a sore finger finds it a little tender, and instead of protecting it with a thimble he becomes obsessed with the idea that the iodine was not strong enough, so into carbolic, lysol, or whatever antiseptic is being boomed by the chemist or the press that unfortunate finger is plunged, all oblivious of the truth that organisms cannot be killed on the body without necrosis of the underlying soft tissues. The analgesic action of the carbolic compounds on the fingers gives a false sense of security to the patient and an anxious time to the doctor, whose danger-sign of throbbing pain is masked. If all goes well the patient will escape with prolongation of finger-tenderness for three weeks or more beyond the normal healing-time. Unfortunately, about the third day the analgesic effect lifts slightly, so more lysol or a hot fomentation is applied, with gangrene as an end-result.

FIG. 2.

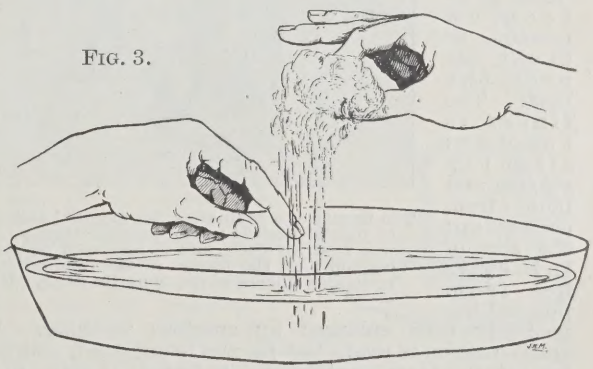


Simultaneous soaking of middle and ring fingers in an injury to either.

Thinking that unless an antiseptic stung on application it could do no good, an ex-officer managed to convert the punctate sting of a gnat into an ulcer three inches long and half an inch wide. I trust the consultation restored his faith in the profession and also that another time one of my colleagues will think of lysol before diagnosing gumma.

It is astonishing how experience differs. Some have never seen any harm done by the carbolic series, whereas I have seen three fingers and an arm amputated for it. Naturally, therefore, I suspect it in all indolent

FIG. 3.



Tenderness of thumb and index-fingers of opposite hand in cases where cleansing in hot lotion has been prescribed.

wounds where necrosis and not pus-formation is the outstanding feature. The atrophic taper finger of the less severe case, once seen, is not likely to be forgotten.

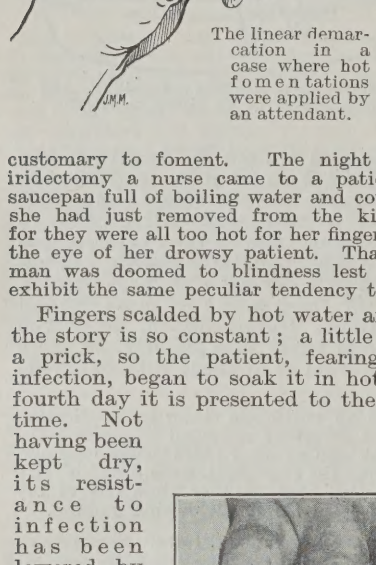
FOMENTATIONS.

It is not, however, to the mechanical irritation of pinch, squeeze, or grip, nor to the chemical irritation of lysol that the prize must be given for the production of the greatest physical pain and misery, but to the *hot fomentation*. The advice to go home and soak a

finger in hot water is criminal. The public interpret this into "the hotter the better," and literally scald their fingers to death. Nor do the shrieks from a casualty department at re-dressing time reveal any advance in the battle against pain.

When lecturing on practical surgery Prof. R. E. Kelly used to point out that a hot fomentation or a cold compress would keep its initial temperature for only two or three minutes after its application and then become, for the remaining two or four hours, a moist dressing at body temperature. What value can two or three minutes' intense heat or cold be to any wound?

FIG. 4.

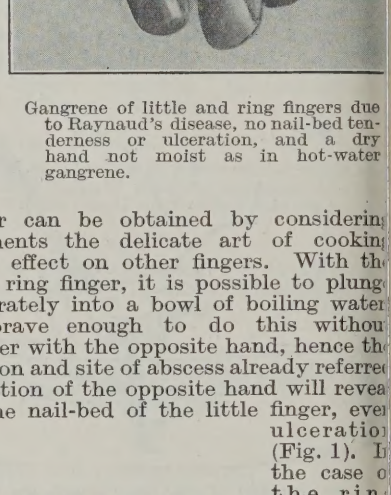


The linear demarcation in a case where hot fomentations were applied by an attendant.

As a student I could not understand why Mr. T. H. Bickerton used ice-water compresses in eye cases. His wisdom may be contrasted with events in another city, where it is customary to foment. The night after a preliminary iridectomy a nurse came to a patient's bedside with a saucepan full of boiling water and cotton-wool dabs which she had just removed from the kitchen fire. Quickly, for they were all too hot for her fingers, she dropped one on the eye of her drowsy patient. That eye was lost and a man was doomed to blindness lest the other eye should exhibit the same peculiar tendency to inflammation.

Fingers scalded by hot water are easily recognised, the story is so constant; a little tenderness followed a prick, so the patient, fearing the possibility of infection, began to soak it in hot water. About the fourth day it is presented to the doctor for the first time. Not having been kept dry, its resistance to infection has been lowered by waterlogging, but rarely is infection present, so great has been the heat. The finger is tender; slightly swollen, and blue from congestion; the site of injury is free from pus and has probably been enlarged by amateur needling. A small incision is made but no pus is obtained, and so fomentations are continued. A few days later the finger is causing anxiety and is the subject of a consultation. At the site of injury a small slough has formed and a little serum is being discharged. The bluish discoloration ends abruptly half way along the proximal phalanx—the line of grip. Into this congested area the medical attendant feels too often convinced that either he or his surgical friend should make a further incision and discover the missing pus. The incision will reveal a deep fascia tinged a beautiful light green from the extravasation of blood pigment, comparable to the discoloration seen on the back of the uterus in pelvic hæmatocele. So long as the tissues are glistening this fascia will recover, often without slough formation. The incision has been a useless one and heals by first intention. If the fascia has lost its glistening appearance the incision will be a useful exit for sloughs. Occasionally the incision will evacuate a few drops of material resembling the "anchovy sauce" of liver abscess. The site at which this pus occurs is usually the line of demarcation, several inches away from the original prick, and not in the centre of the diseased area. The final picture is one of aseptic or dry gangrene due to moist heat; an amputation follows and healing by first intention is the rule—an impossibility if the gangrene were of infective origin.

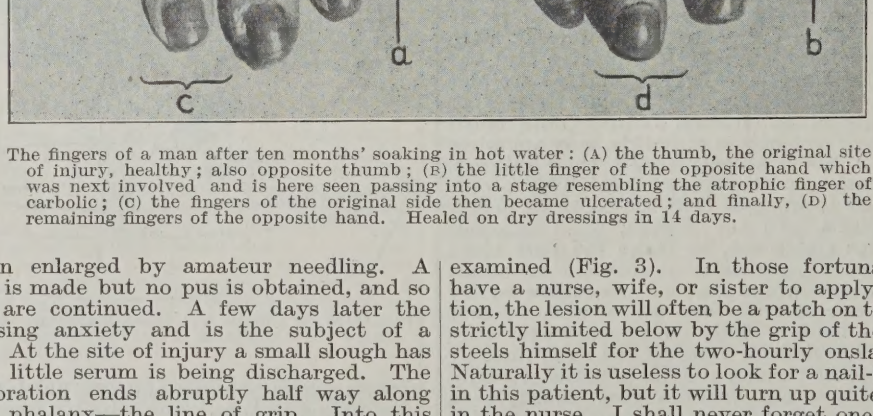
FIG. 6.



Gangrene of little and ring fingers due to Raynaud's disease, no nail-bed tenderness or ulceration, and a dry hand not moist as in hot-water gangrene.

Proof of the deadly nature of boiling water can be obtained by considering for a few moments the delicate art of cooking a finger and its effect on other fingers. With the exception of the ring finger, it is possible to plunge each finger separately into a bowl of boiling water but few are brave enough to do this without gripping the finger with the opposite hand, hence the line of demarcation and site of abscess already referred to. An examination of the opposite hand will reveal tenderness of the nail-bed of the little finger, even ulceration (Fig. 1). In the case of the ring finger it is the middle finger of the same hand that is likely to share the scalding (Fig. 2). If the prescription has been to cleanse the sore with cotton wool whilst soaking then the thumb and index-finger of the opposite hand should be examined (Fig. 3). In those fortunate enough to have a nurse, wife, or sister to apply the fomentation, the lesion will often be a patch on the pricked side strictly limited below by the grip of the patient as he steels himself for the two-hourly onslaught (Fig. 4). Naturally it is useless to look for a nail-bed tenderness in this patient, but it will turn up quite unexpectedly in the nurse. I shall never forget one case in which family relations appeared distinctly strained on my arrival and were made worse by my inquiry as to pain, which the patient forcibly assured me that I should feel if I had a wife and doctor squeezing the sore every few hours looking for pus. Fortunately, an incision appeared necessary, and this, he was assured would obviate the necessity for further squeezing. I felt certain that this finger had also been vigorously

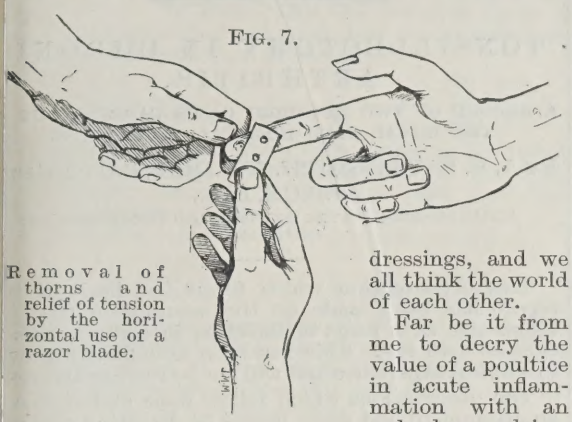
FIG. 5.



The fingers of a man after ten months' soaking in hot water: (A) the thumb, the original site of injury, healthy; also opposite thumb; (B) the little finger of the opposite hand which was next involved and is here seen passing into a stage resembling the atrophic finger of carbolic; (C) the fingers of the original side then became ulcerated; and finally, (D) the remaining fingers of the opposite hand. Healed on dry dressings in 14 days.

calded, but it was too risky to ask. Imagine my joy, s we cleaned the instruments, when the wife apologised or being unable to pick them out of the hot water s her fingers were so tender with applying hot mentations to her husband day and night for the st ten days! The finger healed on cold, moist

FIG. 7.



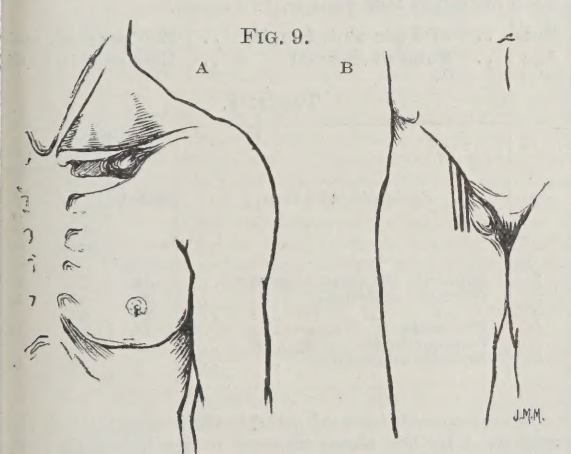
Removal of thorns and relief of tension by the horizontal use of a razor blade.

dressings, and we all think the world of each other.

Far be it from me to decry the value of a poultice in acute inflammation with an unbroken skin. With an open sore it is a very septic application, specially if not renewed each time. Such applications die hard and only recently a friend observed a breast tinged green by natural herbs obtained from the milkman—the cow-dung poultice—for a mammary abscess in 1927.

The last finger I amputated had been poulticed with linseed. Never shall I forget the cloud of steam, as from a Christmas pudding, that greeted me as I exposed the hand, which was swollen enormously from the wrist downwards. Complete loss of the hand appeared imminent—all from a pricked finger that had never suppurated. I waited 24 hours, then amputated the gangrenous finger; the handle-of-the-acquet incision evacuated half a drachm of necrotic pus from the dorsum—a finger-grip abscess—and the

FIG. 9.



(A) The apical gland of the axilla; this site should always be examined, because it is this gland which most frequently suppurates and produces axillary cellulitis. (B) Cloquet's gland, of similar importance to the apical gland of the axilla.

deep fascia was light green in colour. Could the hand be saved? In spite of the so-called pus, that stump healed by first intention; the green dorsal fascia did not slough except just below the styloid process of the ulna, the point of maximum pressure when the finger-grip was changed to a wrist-grip as the size of the poultice was increased. It healed quickly on incision.

Ten months ago a stone-mason developed an abrasion of the pulp of the left thumb, since when nearly every nail has been involved and Raynaud's disease suspected. The moisture of the hand first attracted our attention, for surely a Raynaud's hand would be dry. Then we examined the thumb; it had healed without loss of tissue—also rare in Raynaud. Then came the following story to delight the heart of Sherlock Holmes. For months he had been soaking his fingers in hot water; after the left thumb the little finger of the opposite hand became "septic," then all the finger-nails of the original hand, finally those of the opposite hand; meanwhile the thumb had healed, and with its fellow of the opposite side it remained healthy, being well out of the way of subsequent scaldings. Four days on dry dressings removed all pain. He left hospital in ten days, healed. Note how clearly the little finger of his left hand resembles the atrophic taper-finger of the carbolic days (Fig. 5). Contrast Fig. 6, gangrene due to Raynaud's disease, in hospital at same time.

FIG. 8.

Illustrates the ease with which a small septic focus may be incised after removing the superficial epithelium.

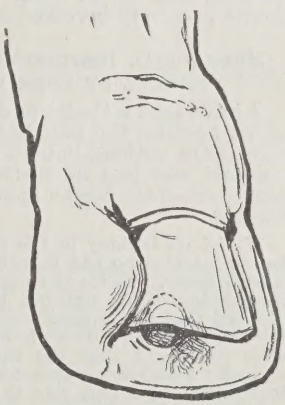
ETHYL CHLORIDE.

A story against myself will suffice. The patient was a doctor; a boil on the back of his finger had commenced to throb, and the hour was late, so we dispensed with an anæsthetist and used ethyl chloride as a local freezing mixture. I opened an infected follicle 5 mm. in diameter, expecting it to separate in three days and heal in a week. It did not heal until a slough three-quarters of an inch long had been extracted by the doctor three weeks later. A slough so big was surely due to the action of ethyl chloride on congested tissue.

THE TREATMENT OF A SORE FINGER.

Keep it dry. Protect it from squeezing by a thimble or celluloidguard. If a thorn is still in do not squeeze. Take a safety razor blade and slice off the over-lying epithelium; this will drag the thorn out and, should the spot suppurate, the denuded area will provide an easy exit for pus and so limit inward spread (Fig. 7). If the finger is throbbing relieve the tension by an incision and then apply moist dressings at body temperature. It is not easy to place these small incisions with accuracy and to avoid the annoyance of seeing the abscess burst two or three days later 1 mm. from the line of incision. Use of the razor blade in a horizontal direction will show up the site of puncture and greatly assist in correctly placing the incision (Fig. 8).

FIG. 10.



The cotton-wool pack beneath the centre of the nail and not its narrow edge, of value in cases of ingrowing toe-nail.

For accurate localisation of an abscess the method adopted by Mr. Frank Jeans is well worth remembering. In kindly thought for his patient he does not brandish a probe, but takes the more homely match. If the centre of the brawny swelling shows a maximal point of tenderness a small collection of pus may be expected; if two maxima are encountered then a larger collection may be expected and the incision must be made between these points. For lines of incision that masterpiece by Kanavel on "Infections of the Hand" should be followed. I owe an early introduction to this book to the late Prof. Thelwall Thomas, whose masterly mind was quick to realise the importance of the work and to distribute it amongst his residents and dressers long before it appeared in the articles and text-books of this country.

Avoid dipping with a pointed knife; the so-called "breast knife" is a safer instrument. Amongst injuries inadvertently produced I recollect a stiff metacarpo-phalangeal joint damaged by an incision in a fruitless search for pus after a stork-bite an inch away. For infected fingers use a general anæsthetic and a tourniquet. Watch lymphangitis; it often subsides without suppuration, and if the lines are broken between the site of injury and the gland, let well alone. Further exploration of the wound, unless there is definite evidence of pus under tension, may turn the scale against the patient. The danger zone is now in the glands.

The epicondylar gland drains the lymph from the little finger and half the ring finger, passing it on with that from the rest of the hand to the axilla. All the axillary glands may be enlarged, but the one most liable to suppurate is the apical gland, because it is liable to be nipped between the clavicle and the first rib (Fig. 9 (A)). A sling should therefore be worn in all cases, and the clinical examination for glands should be completed by gently pressing beneath the middle of the clavicle. In the lower extremity the long axis of the inguinal glands points to the perineum; an unsuspected carcinoma of the rectum may be revealed by this. The femoral glands are much lower in the limb and their long axis points to the toes, but they all enter the iliac glands through the crural canal, and therefore the gland of Cloquet assumes the same importance in infections as the apical gland of the axilla (Fig. 9 (B)). If the glands are enlarged the patient often experiences on the third or fourth day a rigor, rise of temperature, and profuse sweating, as the toxins or organisms previously held up in the gland are poured into the blood stream. This may herald a fatal septicæmia, but fortunately nothing more than a mild rheumatism usually follows. In boils it is often called influenza and figures frequently, together with so-called pleurisy, in the history of perirenal abscess. Do not discard the sling or permit walking until all gland tenderness has disappeared for at least four days, and it is well to remember that the wound is often healed before the glands give trouble, especially in staphylococcal infections.

Greater use should be made of metal cock-up finger splints, discarding these the moment it is realised that the infection is subsiding and that it is wise slightly to prolong healing in order to avoid the stiffening of joints passively involved in inflammatory reaction.

Mechanical Irritation of Nail Growth as a Sequel of Sore Fingers and Toes.

I have seen a typist in danger of losing her employment because the nail had been allowed to grow too soon. On cutting it back she was able to work with comfort and had no further pain because, when the nail reached the tender spot again, good scar tissue had formed.

Whilst on holiday in the South of England I was asked to see a cook who had been tormented for over a year with a sore finger. Twice the nail had been removed and total destruction of the nail-bed had even been proposed. She did not like this suggestion, and, tired of the profession, she kept at home, dutifully cleansing the sore in hot water, with the result that the thumb and index finger of the opposite hand had begun to crack. I recognised that an ingrowing finger-nail was the painful factor, and advised pushing a piece of cotton-wool under the body of the nail in order to lift the pressure off the tender spot. She was cured in three weeks.

For ingrowing toe-nail this cotton-wool pack under the centre of the nail and not under its narrow edge will quickly bring relief, and subsequent square trimming of the nail will prevent recurrence (Fig. 10).

In conclusion, I cannot resist emphasising the damage that is being done by boiling water. Recently I saw a woman with a sloughing carcinoma mammæ, mistaken by her for an abscess. As it was in an awkward situation to foment or soak she had filled the modern wide-necked milk bottle with boiling water and inverted this on her nipple. I have also seen a man with a flexion deformity of the middle finger, the end-result of a knife-cut 20 years ago which took four months to heal and, as he announced with pride, two men to hold it in the boiling water. Abolish boiling water and with it phlegmon.

TONSILLECTOMY IN CHRONIC ARTHRITIS.

A REPORT OF TWO HUNDRED CASES CARRIED OUT AT THE ROYAL BATH HOSPITAL, HARROGATE.

By A. B. PAVEY-SMITH, *M.C.*, M.B., B.Chir. Camb., F.R.C.S. Eng.,
AURAL SURGEON TO THE HOSPITAL AND THE HARROGATE INFIRMARY.

The investigation which forms the basis of this report has been made on the assumption that the tonsil acts as a focus of infection in certain cases of chronic arthritis. This has been abundantly proved by clinical experience and will not be further discussed.

The observations which follow were undertaken as an attempt to find some means of detecting clinically the focally active tonsil, and to discover the type of case most likely to be benefited by its removal. Until these two factors can be fairly accurately determined tonsillectomy for systemic disease must border on the empirical, will be adopted in unsuitable cases, and will prove a source of disappointment.

The 200 cases of tonsillectomy here reviewed have been taken serially, without selection, over a period of six years. I have purposely not included cases done elsewhere, in order to obtain the greatest uniformity in points of diet, technique, and after-treatment. In each of these 200 cases a record was kept of the name, age, sex, systemic condition and its duration, throat history, size and colour of tonsils, crypt contents, condition of the cervical glands, and bacteriological findings. In addition results have been obtained this year in 172 cases.

Sex .. 67·5 per cent. females .. 32·5 per cent. males
Age .. Total average 30 .. Extremes 10 to 64.

Table I.

—	Systemic condition.	Total.	Percentage of occurrence.	
			In whole series.	In males.
1	Subacute rheumatism group ..	54	27	33
2	Infective arthritis C	90	45	43
3	" " D	28	14	5
4	Fibrositis	19	9·5	8
5	Osteo-arthritis	1	0·5	0
6	Neuritis and sciatica	8	4	11

The nomenclature adopted is that originally devised and used by the three mineral water hospitals (Bath, Buxton, and Harrogate).

Group 1 includes subacute cases of, recurrences of, and convalescents from rheumatic fever or "acute rheumatism."

Groups 2 and 3.—"Focal infective arthritis": C indicates that the focus has been located; D that its situation is unknown.

Clinically these cases are of the following type: Onset, at the age of 25 to 40, sometimes acute, often febrile; usually bilaterally symmetrical; at first periarticular; early limitation of movement; smaller joints first affected; fusiform swelling of joints. This category therefore includes many cases of "rheumatoid arthritis" and Still's disease.

The figures are based on the final diagnoses made by the physicians on the patients' discharge. The third column of figures is included to show that sex is not an important influence. The preponderance

of females in "infective D" is due to the inclusion of cases of indeterminate chronic arthritis of atrophic type, the classical "rheumatoid arthritis," which is recognised as affecting women particularly.

Duration.—Several of the subacute rheumatism group were recurrences of an original attack many years before. In such cases the duration given is that of the present attack, and does not include long periods of freedom from arthritis.

Under one year	102 cases.
One to five years	55 ,,
Over five years	43 ,,

I hoped that from a large series such as this some definite clinical picture characteristic of the focal tonsil would emerge. I therefore paid particular attention to five points :—

1. Tonsil history—
   + + = "Related."
   + = Positive.
   0 = Negative.
2. Tonsil colour.
3. ,, size.
4. ,, crypts.
5. Cervical glands.

These five points I regard as the five "landmarks" to be kept in mind when assessing the focal activity of a tonsil, and it was these that guided me in selecting for operation these 200 cases out of over 400 referred to me by the physicians.

History.—Three types were noted :—

1. "Related" (+ +): cases in which attacks of tonsillitis bore a definite relation to the onset or exacerbations of the arthritis.
2. Positive (+): i.e., repeated sore-throats, previous attacks of tonsillitis or quinsy, but unrelated to the arthritis.
3. Negative: "Never any trouble with the throat." With allowances for defective memory and the extremely non-committal attitude, these histories are probably fairly reliable.

Colour.—Redness localised to the tonsil is definite evidence of tonsil infection; general redness of the fauces is usually due to dental sepsis, alcohol, or tobacco; but may mask a tonsillitis. Twenty cases in which the colour was normal showed nothing characteristic in their bacteriology.

Size.—This has been agreed by all observers to be no index of infectivity. I have been unable to find any variations other than could be accounted for by the normal physiological shrinkage with age.

In 30 patients tonsil operations had already been done, in most of them many years previously, and fairly large remains—in some cases apparently intact tonsils—were present. I have always regarded such "remains" with suspicion. The scarred surface may be pale, but the crypts are often full of infective material pent up by the cicatrised crypt mouths. I can find no evidence, however, that they are a greater potential focus than intact tonsils. Their infectivity, however, is more latent, and I should be inclined to advise complete removal of such tonsils in a case of infective arthritis, even though every other point were negative—which is rare.

Crypts.—These are revealed by pus or bleeding on pressure on the tonsil.

Glands.—The key-gland of the tonsil is situated just behind and below the angle of the jaw. Enlargement of these glands can be regarded as definite evidence of tonsil infection, present *or past.*

Tenderness.—This is very rarely met with, even in cases of gross chronic infection. Usually it is only found during or just after acute tonsillitis. It was noted in five cases only.

Associated Infection.—Many cases were edentulous. Some had had extensive extractions some time before with partial improvement of the arthritis. I have made it a rule not to touch the tonsils until dental sepsis has been dealt with. The same applies to purulent nasal or sinus infection.

Bacteriology.—In each case the excised tonsils have been scorched to destroy any surface contamination, cut open, and cultures made from the interior.

Results.—A questionaire was sent out to all patients on Jan. 1st, 1928. The patients were asked to state if the arthritis was cured, improved, unchanged, or worse; 172 replies were received, as follows :—

Cured	35	134	78 per cent. good results.
Improved ..	99		
Unchanged ..	21	38	
Worse	17		

The ratio of good results to bad results is thus 134 : 38. This ratio I have expressed, for comparison purposes, and shall refer to, as the "result percentage"—in this case 78 per cent. These results were reported from three months to six years after the operation. Within these limits the cure or improvement is no transitory affair. The results for infective arthritis in the first three years vary by only 5 per cent. from those in the last three years.

Cross-checking the Figures.

In the search for some "formula" for the focal tonsil each of the five points above mentioned has been taken and cross-checked against the others and compared with the bacteriological findings and the results. Most of these calculations led up "blind alleys" and are too inconclusive to produce.

In the case of *history*, the figures are as shown in Table II. :—

TABLE II.

—	All cases.	—	Subac. rhm. group.	Infec. C. group.
		Per cent.		
Related (+ +) ..	63	31·5	54	26
Positive (+) ..	75	37·5	20	38
Negative (0) ..	62	31·0	26	36

I have been unable to discover any relation between the history of tonsils and their size, the condition of the crypts, or enlargement of glands. The bacterial findings showed that *Streptococcus hæmolyticus* occurred in much greater proportion in the positive than in the related cases. The figures in the two right-hand columns support the recognised clinical fact that acute rheumatism is often preceded or accompanied by tonsillitis. Table III. shows the connexion between a related history and systemic disease from another angle.

TABLE III.

Systemic infection.	All cases.	Related history cases.
	Per cent.	
Subacute rheumatism ..	27	46
Infective C	45	36·5
,, D	14	8
Fibrositis	9·5	9·5

Table III. shows that a related history is commonest in the subacute rheumatism group. Table IV. shows—what does not necessarily follow—that this form of arthritis is commonest among the related history cases.

TABLE IV.—"*Result Percentages*"

Of whole series = 78 per cent. cured and improved.

—	History related.	History negative.
	Per cent.	
In all cases	91	64
In subacute rheumatism group ..	55	50
In infective C group	96	51

It will be seen that the related history cases show a high percentage (91) of good results. The results in the subacute rheumatism group as a whole are also good (93). I concluded at first that the 91 per cent. was due to the relatively large number of subacute

rheumatism cases with a related history. The above figures show that this is not so, the subacute rheumatism percentage being only 55 as against 96 for "infective C." The high percentage of good results in cases with a related history is therefore due to two factors—the larger number of cases of subacute rheumatism with 55 per cent., and a smaller number of cases of "infective C" with 96 per cent. This is an example of the ease with which figures can lead one astray. They show, which was not at first evident, that a related history in a case of infective (focal) arthritis is a particularly favourable point in prognosis when considering tonsillectomy; whereas in subacute rheumatism it is more often met with but does not mean quite so much.

Crypt Contents.—Pus and debris were noted in 156 cases; bleeding only, without pus, in 16. Of the 44 cases in which no pus was found on pressure, 27 cases showed pus in dilated crypts on section. The remaining 17 were fibrous tonsils containing a small amount of serous fluid only and were not heavily infected. These tonsils probably had no bearing on the case, were not really infected, and should not have been removed. In considering a tonsil pressure on which produces neither pus nor bleeding, the other points against it should be very definite before tonsillectomy is advised.

Enlarged Glands.—Table V. shows the incidence of palpably enlarged tonsillar lymphatic glands.

TABLE V.—*Glands.*

Type of case in which glands were enlarged.	Per cent.	Type of case in which glands were enlarged.	Per cent.
All cases	57·5	Related (+ +) history	61·0
Large tonsils	60·0	Negative history	58·0
Medium ,,	60·0	*S. hæmolyticus* infection	55·0
Small ,,	54·0	Subacute rheum. group	54·0
Tonsillar "remains"	60·0	Infective C group	60·0

It will be seen that these figures show very little variation. They afford an instance of the "blind alleys" referred to earlier and show that, although enlargement of these glands points to tonsillar infection, it is no indication of focal activity. It must be remembered that they may remain enlarged after a tonsil infection has subsided.

Table VI. shows the bacteriological findings. A streptococcus was isolated in 197 out of 200 cases—i.e., 98·5 per cent.

TABLE VI.—*Bacteriological Findings.*

Organism.	—	In pure culture.
	Per cent.	
Streptococcus hæmolyticus (pyogenes)	36·5	8
,, *viridans (salivarius)*	92·5	29
,, *non-hæmolyticus*	49·0	5
S. mucosus capsulatus	4·5	—
Micrococcus catarrhalis	2·5	—
Bacillus pfeifferi	1·0	—
Pneumococcus	0·5	—

There were only three non-streptococcal cases; two of them yielded *Staphylococcus albus* only and belonged to the infective arthritis D group. The third, a subacute rheumatism, gave *S. albus* and *aureus*.

In only one case, and then only on one side, was a sterile tonsil found.

The Part Played by Streptococcus viridans.

For comparison and control purposes 100 tonsils, removed from children of under 10 years, have been examined by the same technique. These tonsils were of the hypertrophied type and were selected as the nearest obtainable to the normal tonsil. Table VII. shows the bacteriology of these. A streptococcus was isolated in 72 per cent.

I think it is very curious that the pneumococcus was only found in one of my rheumatic cases, in view of its frequency in nasal infection. It suggests the possibility of transmutation. In the great majority of cases the infection was symmetrical. For calculation purposes the *Streptococcus viridans* was so ubiquitous as to preclude any useful comparison.

TABLE VII.—*Organisms in "Normal Tonsils."*

Organism.	—	In pure culture.
	Per cent.	
Streptococcus hæmolyticus	11	1
,, *viridans*	68	16
,, *non-hæmolyticus*	17	Nil
S. mucosus capsulatus	1	—
Micrococcus catarrhalis	21	—
Bacillus pfeifferi	6	—
Pneumococcus	10	—
Sterile	8	—
Staphylococcus albus only	5	—

I therefore took the *Streptococcus hæmolyticus* cases—36·5 per cent. Calculations show that this organism is not specially associated with pus or enlarged glands; it shows no predilection for subacute rheumatism (35 per cent.), or for infective arthritis C (42 per cent.). There was nothing to indicate any greater severity of the arthritis; and the results were only very slightly better than those for all cases—82 per cent. as against 78 per cent. The only fact that emerged was that which has been already stated under history—an occurrence in 42 per cent. of positive cases against only 22 per cent. in related cases. It appears to me probable that the *Streptococcus hæmolyticus* is associated with ordinary tonsillitis, acute or chronic, rather than with arthritis and the focal tonsil. I think that to this bacteriological class belong several patients whose arthritis has remained stationary or become worse, but who have clearly stated that their general health has considerably improved since the operation. It is significant that one case when first admitted had acute tonsillitis; culture of the pus from the crypt mouths produced *Streptococcus hæmolyticus*. A fortnight later the tonsils were removed and grew *Streptococcus viridans* only.

The 11 cases with neither *Streptococcus viridans* nor *Streptococcus hæmolyticus* show nothing characteristic.

There remains the problem of *Streptococcus viridans*, which is either an active agent in infective arthritis or is so common as to mean nothing. The evidence is in favour of the former; for, in brief, the *Streptococcus viridans* has been found associated with arthritis by many observers, has reproduced experimental arthritis in animals, and is a normal inhabitant of the mouth; its virulence is highly variable and, like other streptococci, and in their company, it probably leads a double life. It is accepted that a strain, at first harmless, may be made virulent by passage through animal tissues, and I am inclined to believe that the normal tonsil normally contains in its crypts the *Streptococcus viridans* in a quiescent state; that damage to the crypt epithelium occurs, that the organism meeting with a raw surface penetrates the tissues, becomes virulent, and, *given the proper conditions*—necessarily a wide term—produces substances sufficiently toxic to produce changes in joint and fibrous tissue, substances which are formed in proportion to the activity for the time being of the organism, and one of which is chemically neutralised by salicylates.

I think it must be admitted that the above analysis fails to show that a focally active tonsil possesses any peculiar characteristics by which it can be clinically identified.

Results of Tonsillectomy.

The results prove a little more illuminating. These numbers are based on accurate counts. They are derived from the signed statements of the patients

themselves, and in points of doubt I have not taken the benefit. The difficulty is one of interpretation. There are so many factors to be considered that only by cross-checking in every possible direction has it been possible to minimise the error of attributing success or failure to the wrong cause.

TABLE VIII.

Group.	Cured	Improved	Unchanged	Worse	Percentage cured and improved.
Subacute rheumatism	17	24	2	1	93
Infective arthritis C	14	56	8	7	82
" " D	1	9	4	6	50
Fibrositis	5	7	4	1	71
Neuritis	Nil	2	3	1	33⅓

In neuritis it is probable that the fibrous tissue survives the removal of the infective focus which caused it, ultimately contracts, and produces persisting pain by pressure. Tonsillectomy, therefore, can do little beyond preventing extension unless the disease is in its very early stages.

TABLE IX.—*Age as a Factor.*

—	Cured.	Improved.	Unchanged.	Worse.	Percentage cured and improved.
Up to 20 ..	12	23	2	2	89
Over 40 ..	2	27	2	5	80

As might be expected, results are better in younger patients. At the same time it is clear, from the figure of 80 per cent., that an age of 40 or over is no bar to a successful result.

TABLE X.

Age in years.		10 to 20.	21 to 30.	Average age— under : : over	31 to 40.	41 to 50.	51 to 60.	Over 60.
No. of cases	cured ..	12	16	28 : : 7	6	—	1	—
	worse ..	2	6	8 : : 9	4	1	3	1

In Table X. the proportion 28 : : 7 is exaggerated by the high percentage of good results in the subacute rheumatism patients, whose average age was low—25. These good results might appear to be due to this age factor, but are not so in reality. The improvement percentage of subacute rheumatism cases over 30 is still 91 per cent. Age, therefore, is not as important a factor as appears at first sight.

TABLE XI.—*Duration of the Systemic Disease.*

Duration.	Cured.	Improved.	Unchanged.	Worse.	Percentage cured and improved.
Under one year..	33	44	7	6	85
Over five years ..	2	22	5	4	73

Of the 35 cured cases in Table XI. the duration was less than a year in 33. This high ratio is exaggerated by the fact that in 51 per cent. of the whole series the duration was less than one year, the duration numbers being as follows:—

Under one year	102 cases.
One to five years	55 "
Over five years	43 "

A duration of more than one year in subacute rheumatism, and more than three in "infective C" was exceptional. Duration, however, does appear to be a factor in prognosis. The results show that a complete cure is unlikely if the arthritis has lasted more than 12 months; but that after five years 73 per cent. of cases are still capable of improvement. I consider that a long duration in a patient over 40 should make one very carefully balance the rest of the evidence before embarking on tonsillectomy.

TABLE XII.—*Percentages Cured and Improved under Various Categories.*

Category.	Per cent.	Category.	Per cent.
Subacute rheumatism—		*Streptococcus hæmolyticus*	
Under 30	94	cases	81
All cases	93	Enlarged glands	77
Related history cases ..	91	Duration more than five years	73
Aged 10 to 20	89	Fibrositis	71
Duration less than one year	85	Negative history cases..	64
Infective arthritis C—		Infective arthritis D ..	50
All cases	82	Neuritis..	33⅓
Under 30	82		

The importance of the figures in Table XII. must not be exaggerated. They represent a very small attack on the problem of chronic arthritis. During the time that these 200 patients were dealt with over 7000 cases of many and various forms of arthritis and allied conditions passed through the hospital. If, however, these results are better than those obtained without the aid of surgery they tend to confirm the focal infection theory. Possibly research into the histology of proved "focal" tonsils may reveal something of the barrier which stands between the system of one individual and an infection which, in another, results in such widespread tissue changes as are seen in chronic arthritis. S. J. Crowe,[1] working on these lines, has found ulcerated areas in the crypt epithelium of tonsils removed from patients with infectious arthritis (="infective arthritis" C).

Summary of Conclusions.

1. A probable tonsil focus can be found in a large number of cases of subacute rheumatism, chronic infective (focal) arthritis, and fibrositis.

2. When searching for a focus in the tonsils attention should be paid particularly to their history, size, colour, crypt contents, and to the associated lymphatic glands; and these points should be carefully balanced before deciding on tonsillectomy: (*a*) In an actively focal tonsil one or more of these points may be negative, but if all five are negative the tonsil should be assumed to be healthy. (*b*) The tonsil of chronic tonsillitis without systemic infection cannot be distinguished from the focal tonsil by physical signs or by present bacteriological methods, but only by inference.

3. In selecting cases for operation a history of tonsillitis associated with onset or recurrences is favourable in cases of infective (focal) arthritis, and to a lesser extent in subacute rheumatism, where such a history is commoner.

4. The younger the patient, and the shorter the duration of disease, the better the prospects, but within very wide limits neither age nor duration are a bar to success.

5. The bacteriological evidence, though insufficient to convict the *Streptococcus viridans* as the primary infective agent in chronic focal arthritis, increases the suspicion under which this organism already lies.

6. In the subacute rheumatism group the results are so good that the operation should become a routine part of the treatment, if only as a prophylactic against recurrences and later endocarditis.

7. In cases of chronic focal arthritis, if the balance of evidence, obtained as indicated in Conclusion 2, condemns the tonsils and they are completely excised, improvement may be expected in 80 per cent. of cases.

In conclusion, I have to express my gratitude for the help given me by my colleagues and others on the staff of the Royal Bath Hospital.

[1] Archives of Internal Medicine, April, 1924, xxxiii., 473–482.

PEMPHIGUS NEONATORUM.

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The synonyms of "pemphigus neonatorum" are impetigo contagiosa neonatorum, bullous impetigo of infants, Ritter's disease, pemphigus contagiosus, and impetigo contagiosa bullosa.

It is a rare but highly contagious disease of the skin occurring in the new-born, usually between the fourth and fourteenth day after birth. It is characterised by the development on various parts of the body of vesicles, bullæ, or blebs, which rupture readily, leaving moist, red, smooth, glistening defects in the uppermost layers of the epidermis, which, in cases that recover, heal without a scar. Two forms of the disease are usually distinguished:—

1. A *mild type* in which the skin lesions are not numerous and tend to dry up and heal more or less quickly, and in which there is freedom from systemic disturbance. In this type recovery occurs within a few weeks.
2. A *grave type* in which the skin eruptions continue to arise and to extend over large areas of the body and in which there are febrile and other systemic manifestations.[1]

The distribution, as recorded by Cole and Ruh,[2] is universal, cases having been reported in Europe, America, Japan, and Asia. It occurs sporadically and in localised epidemics.

Historical.

Pemphigus neonatorum was first described in France in 1773 by Ochène.[3] In England an epidemic occurred in 1834 and was described by Rigby [4]; several mothers contracted the disease from their children, and Rigby himself was infected. Ritter recorded epidemics occurring in a foundling hospital in Prague between 1878 and 1880, with a mortality of 48 per cent. In 1886 Demme [5] studied the bacteriology, and isolated and cultivated a non-chromogenic diplococcus. In 1891 Almquist [6] described in the serum from a vesicle a diplococcus which on culture resembled the *Staphylococcus aureus*. This organism, on inoculation on the human skin, was found to produce a vesicular eruption, and in this way differed from the typical *S. aureus*, which commonly produces a follicular infection. Therefore Almquist suggested that the organism should be called *Micrococcus pemphigi neonatorum*. In 1900 Matzenaur [7] concluded that pemphigus neonatorum and impetigo contagiosa were due to the *S. aureus*, and that they were identical diseases. Some confusion has arisen from the fact that in the same year Sabouraud [8] came to the conclusion that the impetigo of Tilbury Fox (impetigo contagiosa of children and adults) was due to a primary infection with streptococci. Sabouraud found that if the blister contents were cultured in ascitic fluid a streptococcus grew after 48 hours' incubation, and that in equal quantities of broth and ascitic fluid, incubated for 24 hours, the cultures contained a mixture of streptococci and staphylococci, while if broth alone was used as the culture medium, and incubated for 12 hours, the fluid contained a few streptococci and numerous staphylococci. In 1903 Whitfield [9] described a case in which the date of onset was the seventeenth day after birth; two days later the mother developed a typical lesion on the hand. Cultures from the contents of a vesicle in a capillary tube of ascitic fluid, as described by McLeod,[10] produced a pure growth of streptococci from the child and of streptococci and *S. aureus* from the mother. It is to be noticed that Sabouraud was dealing with the impetigo contagiosa of Tilbury Fox, and that in Whitfield's case the date of onset was unusually late (17 days), so that he may have been describing a similar condition in an infant. We think these cases of streptococcus infection are to be distinguished from those of true impetigo contagiosa of the new-born.

In 1903 Maguire [11] described an epidemic of 18 cases, with a fatal result in eight; all the cases but one had come into contact with a nurse suffering from "pustular acne." In many instances infection was spread to other members of the family when the patient arrived home, producing in some typical bullæ. He states that in all the fatal cases the umbilicus became infected during the course of the disease. In the two cases investigated *S. aureus* was isolated. In 1906 Clegg and Wherry,[12] examining an epidemic at Manilla, agreed with Almquist that the coccus isolated closely resembled *S. aureus* on culture medium, but differed from it in that litmus milk was coagulated in a week and that no indol was produced in broth. The diplococcal arrangement could be reproduced in milk and serum-broth cultures. Experiments in animals failed to produce any typical lesions, but auto-inoculation produced a typical bulla in 30 hours; the organism, however, was not recovered from the lesion, which healed in 48 hours. In 1914 Cole and Ruh [2] described a series of eight cases, and grew *S. aureus* in pure culture in each. In 1917 F. H. Falls [13] described his very complete investigations on a series of 69 cases which occurred at Chicago in 1915 and 1916, and concluded that the disease was caused by infection with *S. aureus*, and that this differed from other staphylococcal infections in that the organism produced vesicular eruptions on inoculation into man, and also that in certain liquid media it appeared as a diplococcus which formed short chains. A staphylococcus is also cited as the causative agent by a number of continental writers in recent years: Weiland 1922,[14] Shultheiss 1923,[15] Stern 1927,[16] and Richter 1927.[17] In 1925 Millon, Caldwell, and Winians [18] described an outbreak in which the infecting agent was a *S. aureus*, derived, they considered, from the mother's milk. We have investigated the matter, and have concluded that this is an unlikely and unusual method of infection.

Cases Examined by the Present Writers.

We have had the opportunity of observing two epidemics and one further isolated case in the lying-in wards of a general hospital, and two cases at a lying-in hospital; these institutions will be referred to as hospitals A and B respectively. In March and April, 1927, an epidemic of 18 cases occurred in the maternity wards of hospital A. The average age at onset was six or seven days, the youngest infant being 4 days old and the eldest 12 days. The eruption began on the head, face, or chin in 11 cases, and in the other cases appeared first on the fingers, arms, wrists, axillæ, shoulders, neck, legs, or toes. In all cases where fluid could be obtained from an unbroken vesicle *S. aureus* was grown in pure culture and no other organism was obtained. The interval between the cases varied from one to nine days. As soon as the diagnosis was certain the mother and child were isolated from the other maternity patients. During this time a nurse attending the babies was found to be suffering from "a series of boils," and when she left the ward the epidemic ended.

In July, 1927, there was a small epidemic of four cases. The age of the babies at the onset varied from 5 to 16 days, the eruption broke out on the fingers in two cases, the neck and head in one case, and the toes in one case. From all vesicles examined *S. aureus* was grown in pure culture. The interval between the cases varied from one to ten days. In this outbreak no primary source of infection could be found, and we therefore proceeded to make observations as to the occurrence of *S. aureus* in the normal child and mother. (These will be referred to later.) A few days after the first case was transferred to the isolation ward the nurse under whose care it had now come developed a vesicular eruption on her knuckles from which a *S. aureus* was isolated.

In January, 1928, a solitary case occurred at hospital A. The child was 10 days old at the time

of onset, and had the typical bullous eruption on the fingers of the left hand, the back of the neck, and just external to the nostril. A pure culture of *S. aureus* was obtained from the blister fluid. The mother was then found to be suffering from a perionychial infection of the bullous type, which she had first noticed four days before the onset of the eruption on the child. The mother's lesion was cultured when the child was first seen, at which time it was in the stage of recovery, and *S. albus* was found in pure culture.

In February, 1928, we were fortunate enough to have permission to examine two cases which occurred in hospital B. Both began on the same day, in infants 4 days old. One child had a lesion on the right thigh and the other a lesion on the right shoulder. When first examined by us the vesicles had already ruptured and had been covered by a weak mercurial ointment; a culture was taken, however, by raising up the edge of the broken bulla, and in each case *S. aureus* was obtained in pure culture. We think it probable that these infants were infected by the nurse who had attended them on the day of birth, for on the following day she reported that she had for a day or two noticed a small pustular vesicle on the hand. She was sent off duty, and while off duty a week later a similar vesicle occurred on another finger. In all these cases constitutional symptoms were absent, except in two cases with extensive exfoliation, and the umbilical scar was unaffected.

Our cases show a probable source of origin of the first epidemic in a nurse with "boils," after whose departure the epidemic ceased; this was a temporary nurse from outside the institution, and no accurate note of the nature of the lesion was made. In the second epidemic no original cause was found, but the infection of a nurse from a baby occurred. In the third a pre-existing vesicular eruption was present in the mother. In the fourth a nurse with staphylococcal vesicles of the hand was considered to be the cause. The direct contagiousness to and from adults, and the fact that, in nearly every case, the vesicular infection remains true to type is well illustrated.

Bacteriology of the Epidemics.

We found no streptococci and no infecting agent except *S. aureus*. We examined blisters in their very early stages and found organisms present in considerable numbers; whilst many of these were in diplococcal rather than in staphylococcal form, we have not found, either in films or cultures, anything that could properly be called a streptococcus. In cultures, more especially perhaps on serum-containing fluids, the cocci may take up a chain form of three or four members, but this is also found in cultures of *S. aureus* from any active lesion. On solid medium, such as serum-agar, the staphylococcal arrangement once more becomes apparent. The relative lack of pathogenicity of the organisms when injected into mice shows the character of a staphylococcus rather than a streptococcus, and this we found whether we injected the blister fluid itself or the cocci grown from it.

The *S. aureus* isolated in some five cases was fully tested and found to be hæmolytic; it acidified milk but without clotting, and no indol was produced in peptone water. In these and in the sugar reactions we found no fixed differentiating character from the ordinary *S. aureus* isolated from boils and carbuncles, cultures from two of which were examined in parallel with those from the pemphigus blisters as controls. The staphylococcus characteristic of pemphigus neonatorum differs from that commonly isolated from boils and other follicular infections of the skin in that it produces vesicular lesions, not only in the new-born child but also in those cases in which we have been able to trace the passage from a child to an adult.

In three cases fluid from blisters was inoculated direct into a mouse subcutaneously; it had no lethal effect, and streptococci were not found in the blood stream.

Examination for a Filterable Virus.

We have also sought for a filterable virus which might be acting as a primary infecting agent or as an adjuvant to the cocci. Fresh fluid from the blisters was injected intradermically into the footpads of guinea-pigs and mice (five cases). In these circumstances the relatively small numbers of staphylococci present have no harmful effect, whereas if a filterable virus were present we might expect a herpetiform eruption. Our results were entirely negative. As a contrast we examined one child of 6 months with a typically bullous eruption, and on culture of the blister-fluid both streptococci and staphylococci were grown in ascitic fluid media. We concluded that the patient was suffering from the impetigo of Tilbury Fox, thus confirming the work of Sabouraud and Whitfield, and further differentiating the ætiology of pemphigus neonatorum from that condition.

Types of Outbreak.

The epidemics we have traced in the literature seem to fall into three classes:—

1. Those of a violent and rapidly spreading type like those described by Rigby[4] and Ritter. In these instances one must presume that there has been a direct transmission of the virus from case to case. This direct transfer makes both for rapidity of spread and, by "passage" of the organism, for increased virulence and higher mortality.

2. Epidemics such as that described by Schultheiss,[15] in which a large number of cases were infected from the same source in a short space of time. The sudden widespread nature of the epidemic in this instance led to the implication of the institution laundry, and it was found that the clean linen was being sorted by a person with a suppurating perionychia.

3. The common type of epidemic, such as that with which we have had to deal, and which consists usually in a series of mild cases. In these we suspect some constant carrier of infection, but have not always succeeded in identifying it.

Schultheiss [15] refers to cases of infantile conjunctivitis during the epidemic. We have noted the same thing, both during the epidemic and also during periods when the wards were entirely free from pemphigus. Cultures from most of these cases grew *S. aureus* only, and it seems probable that this infection is closely allied to pemphigus neonatorum.

Mortality.

The mortality in the earlier epidemics described by Ritter and Maguire was 48 per cent., but recently it has been very much less, and in our own series there were no fatal cases. It has been repeatedly found that involvement of the umbilicus, with its large, recently clotted vessels, is likely to lead to pyæmia and death. Undoubtedly the low mortality in recent epidemics is related to the immediate isolation of infected cases and to the modern aseptic treatment of the umbilical scar.

Spread of Infection.

Wherever in our cases we have been able to trace the conveyance of infection either from the adult to the baby or vice versa the infection has been, with one doubtful exception, of a pemphigoid character. We therefore think it probable that a lesion of pemphigoid type, whether in an adult or infant, is much more likely to arise by infection from a similar blister lesion than from the ordinary follicular type of staphylococcal infection. If the staphylococcus is, as we believe, the cause of the infection we must look for direct contagion by transfer from case to case or from parent or attendant. In addition to direct contact infection Schultheiss's epidemic shows a conveyance by fomites (i.e., linen).

Auto-infection.—The possibility that the infective organism is present on the skin and causes an infection as a secondary effect of some constitutional condition cannot be overlooked. We see instances of this sort in certain trophic and toxic conditions, for instance herpetic eruption or the pustule of

small-pox, in which the staphylococci take root in the cutaneous tissues, apparently as a result of a central infection by some other virus. *S. aureus* may be found on the normal baby, but our own experimental work and that of Falls does not support the thesis of an infection arising spontaneously in this way, nor of a primary infecting factor which might let in *S. aureus* as a secondary invader. Dr. Gregorson in a recent article [19] speaks of a toxic neuritis in certain motor nerves, but it is difficult to see how this could be related to cutaneous infections, nor have we noted the constitutional enfeeblement to which he refers in either mother or child.

Possible Sources of Infection.—We have shown one source of infection in some of our cases to be specific blister infections of the skin due to staphylococci, but in other cases and in some reported epidemics no such source has been demonstrated. We therefore decided to investigate the occurrence of *S. aureus* in the milk and throats of mothers in the antenatal and puerperal states, and also to investigate the incidence of this organism on the recently born healthy infant. We found in the antenatal clinic (attached to hospital A) that *S. aureus* occurred in 12 per cent. of throat swabs from 66 patients. An examination of the breast secretion in 34 cases showed that the *S. aureus* occurred in one case only, or 3 per cent.; 36 per cent. were found to contain *S. albus* and 60 per cent. were sterile. In the puerperium 83 throat swabs were cultured, and of these 15 per cent. contained *S. aureus*. In 58 cases in which we cultured the milk 17 per cent. contained *S. aureus*. We then investigated 25 normal babies from 4 hours old to 9 days old; in each case a swab from the nose, the skin, and the umbilical cord or scar was cultured. The outstanding feature of this investigation was the frequent presence of *sarcina lutea* in all the situations examined. *S. aureus* was found twice in the nares and three times in the umbilical scar, but in no case on the ordinary skin surface. In the three cases where *S. aureus* was found on the child the mothers were investigated also, but no coccus was grown from either throat or milk. From this investigation we concluded that the bacteriology of the infant's skin, nose, and cord has no close relationship to that of the mother's milk or throat.

In the last three cases of impetigo neonatorum investigated we carried out bacteriological examinations of the mother's milk and throat and found that the *S. aureus* was not present in either; moreover, this organism was not found on the children's skin apart from the lesion, nor about the umbilicus or nares. In these three cases a definite source of infection was found elsewhere; in the first case the mother had a perionychial vesicular infection, and both the last two cases were attended on the day of birth by a woman with an infected vesicle on her finger.

S. aureus, therefore, may be carried in what appears to be a harmless form on various regions of the body in both adults and babies. It is fairly common in the throats of quite healthy people. We have found it in the colostrum of pregnant women some weeks before delivery and in the milk after delivery; if there is any congestion of the breast it is fairly often present. The organism found in most instances presents the cultural and biochemical characters of *S. aureus* as isolated from suppurating lesions such as boils or pemphigus blisters. In addition to these sources among apparently healthy people it is certain, from the frequency of mild infections of staphylococcal type such as blepharitis and small cutaneous pustules, that new-born babies must frequently come in contact with this infecting agent. In spite of this the disease remains comparatively rare, and it seems probable that the ordinary cutaneous pyogenic infection is at any rate less likely to lead to pemphigus in contacts than is a specific type of blister lesion.

In all the routine biochemical tests we have not found the staphylococcus of pemphigus neonatorum to differ from that of follicular abscesses, and in this our findings for the most part confirm those of other workers.

Conclusions.

(*a*) Pemphigus neonatorum is due to a primary infection with a *S. aureus*—i.e., one indistinguishable biochemically and culturally from the *S. pyogenes aureus*.

(*b*) In most cases the primary source of infection can be traced to a septic focus on the mother or on one of the attendants who come directly or indirectly in contact with the infant. In our cases the septic focus was in nearly every case of the blister type and we consider that probably this type of lesion is much more apt to lead to pemphigus infection than the commoner types of staphylococcal lesion such as follicular abscesses.

(*c*) *S. aureus* is frequently found in the throat and milk of mothers before and after childbirth, but this cannot be considered the usual primary source of infection.

(*d*) In fatal cases it is found that the umbilicus has usually become inflamed and it should therefore always be kept as clean as possible.

(*e*) Our experiments, although limited in number, do not support the thesis of a filterable virus.

Our conclusions differ slightly from those set out in the Ministry of Health Memorandum, in that we believe the staphylococcus to be the sole cause of the infection. We further think that conveyance of the infection is usually from a blister type of lesion—that is to say, from a superficial infection of the skin including, for instance, an infective eczema. We also think that the staphylococcal conjunctivitis sometimes seen in the new-born may be an allied condition.

Suggested Measures During an Outbreak.

Infected cases should be isolated.

Bed, bedding, &c., should be sterilised, but burning it should be entirely unnecessary.

All other infants should be carefully examined for possible early stages of infection, and for allied infections such as conjunctivitis.

The mother and attendants should be examined for septic conditions and the laundry staff for possible infection, including any recent history of cutaneous infection, especially of the bullous type. In this inquiry the wholehearted coöperation of the nursing staff must be carefully sought. It is very important that they should not, as so often happens, get the wrong impression and be made to feel that there is any imputation against their skill or cleanliness.

If the epidemic continues it might be well to cease bathing all new-born babies and substitute rubbing the skin with sterile oil.

In all cases of pemphigus neonatorum particular attention should be paid to keeping the umbilicus healthy, and it should be dressed, apart from the general toilet, with a dilute mercurial ointment, as a prophylactic measure.

Our thanks are due to Dr. E. I. Clark for help with the bacteriological work of this investigation.

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A STUDY OF 'ASSIVE IMMUNISATION IN SCARLET FEVER.

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Any procedure which will cut short an outbreak of fectious disease must be regarded from all points view as of very great value. Its value to the ntact cannot be over-estimated, for by its means he ay escape an attack of the disease and the consequent ssible risk to life and well-being, certain loss of time, d in many cases financial loss. Also it is obvious at when the outbreak occurs in hospital and when iarantine has to be observed a certain proportion of e contacts are bound to be detained for a longer or orter period after they are fit to return home. ıould a secondary case arise this period must, of urse, be lengthened by another quarantine period id, considering the problem from the standpoint of spital administration, any method of obviating or ducing quarantine periods must result in a consider- le saving of patients' accommodation and expense. a clinical investigation of the new work on scarlet ver [1] one of us demonstrated that a passive ımunity to scarlet fever could be brought about by e injection of scarlet fever antitoxic serum, and it as to make a detailed study of this phenomenon and test its practical possibilities in the limitation of itbreaks of scarlet fever in the non-scarlet fever ards of an infectious diseases hospital that the llowing work was carried out. Our study has tended over a period of two years; observations ıve been made in 40 separate outbreaks of scarlet ver and include the immunisation records of over 50 individuals. Other workers have employed the ethod, particularly in children's [2] and infectious spitals [3 4 5 6] throughout the country, and it ppears to have been successful both when the ımunity was estimated by the Dick test and when was assessed in terms of actual resistance to the sease.[4 7] The dosage now generally recommended from 2·5 to 5 c.cm. of the concentrated antiserum, it, as James [8] has pointed out, comparatively little ork has been published in this country on the amount antitoxin necessary to secure protection. As a sult of his investigation he came to the conclusion at 5 c.cm. is usually sufficient to protect susceptible ntacts for a minimum period of seven days, but that rtain highly susceptible individuals giving a strongly sitive Dick reaction probably required 10 c.cm. uickshank [9] has also worked at this problem and ates that in general 2·5 c.cm. of a concentrated ıtitoxin protects for three to six days, 5 c.cm. for ven to ten days, and 10 c.cm. for two or three eeks, and in another paper [10] he indicates that the ımediate protection afforded by different doses of e antitoxin does not vary very much, but that the ief effect of increasing the dose is to bring about a ore lasting immunity.

Methods.

On the occurrence of a case of scarlet fever in a non-scarlet ard the cross-infected case was promptly isolated and search ade for a probable infecting case. One of two measures as then adopted, attempts being made to limit the outbreak ther by quarantining the ward or by protecting the exposed sceptibles, after which quarantine was removed. As far possible these measures were used alternately, so that e results of the passive immunity experiments were ntrolled by those in which quarantine was observed. nce all the wards in which scarlet fever appeared contained ı average number of 20 beds, the total numbers exposed ould be comparable. In the passive immunity experiments l contacts were Dick-tested immediately, the results being rutinised after 24 hours and classified as follows: Reac- ons under 10 mm. in diameter Class I., from 10–20 mm. ass II., from 20–30 mm. Class III., and above 30 mm. Class IV. Following the practice of other observers, we have for practical purposes regarded Class I. reactors as immune. The susceptibles were then given their injections of scarlet fever antitoxin by the subcutaneous or intramuscular route, and were re-tested at an interval of 24 or 48 hours and at weekly intervals until they became positive again or were discharged from hospital. The toxin used in the testing was supplied by Dr. Hartley, of the Medical Research Institute. We were conversant with its properties and we have proved it over a long series of comparative tests to be exactly comparable with the Dick reagent used extensively in this country. The antitoxin was the ordinary commercial preparation put on the market by two well-known firms.

Immediate Results of Various Doses of Antitoxin.

In an attempt to decide upon the optimum dosage sufficient for immediate and complete protection we have employed injections of 3 c.cm. in 57 cases, 4 c.cm. in 41 cases, 5 c.cm. in 120 cases, and 10 c.cm. in 43 cases. On re-testing we found that after a 3 c.cm. dose 51 individuals (89·4 per cent.) became Dick-negative; after 4 c.cm. 40 (97·5 per cent.) became Dick-negative; after 5 c.cm. 101 (84·1 per cent.) became Dick-negative; and after 10 c.cm. 41 (95·3 per cent.) became Dick-negative.

These results raise some very interesting practical questions. For instance, it is a matter of considerable importance to find in a significant series of cases that 5 c.cm., which has come to be widely recommended as a suitable dose for the purpose, fails to confer passive immunity in 16 per cent. of cases, and that even by doubling this dose we cannot be sure of conferring a passive immunity on every case. It is also interesting to find that 3 c.cm. and 4 c.cm. doses seem to be as effective as the larger amounts. In considering these results as a whole, three factors occur to us as requiring attention. These are the possible variation of antitoxic content of various batches of serum, the question of age, and the state of susceptibility of the patient. Examination of the individual results in the various groups of patients immunised at any single time shows that no great variation in antitoxic content in the various batches could be detected. The 5 c.cm. series, the largest, was composed of 11 groups, each consisting of from 8 to 15 susceptibles. Only in three of these did we obtain a complete group immunity after protection, whereas in the remainder, according to the smaller or larger numbers comprised in the group, there were one, two, or three failures, and in no experiment were the unsuccessful cases concentrated in any single group. The same fact emerges from an analysis of group results in the other series. The question of age has also been examined; in the 5 c.cm. group there were seven failures to protect among 57 children under the age of 5, or 12·2 per cent. In the age-group 5–10, consisting of 47 children, there were 13 failures, or 27·6 per cent., and in the age-group 10–15 there were 5 failures out of 12, or 41·6 per cent. In spite of the fact that this important point is not brought out in either of the series immunised with 3 c.cm. or 4 c.cm.—all the failures in these being scattered indiscriminately throughout the age-periods under 5—we are inclined to attach importance to the suggestion implied in the analysis of the larger numbers, and feel that in considering dosage regard should be paid to age. The question of susceptibility also requires attention, and we have been able by grading our reactions to correlate this factor with the results of passive immunisation. In the 5 c.cm. series we find that this dose failed in 7 out of 16 Class IV. reactors (43·7 per cent.), in 9 out of 52 Class III. reactors (17·3 per cent.), and in 7 out of 52 Class II. reactors (13·4 per cent.). Unfortunately the Dick reactions were not graded in the 4 c.cm. series, but most of the 3 c.cm. series and all of the 10 c.cm. were graded, and an analysis of these brings out the same point. Our failures may partially be ascribed, therefore, to the high susceptibility, as shown by the Dick test, of a proportion of the patients. From a study of our records we find that after intramuscular inoculation of the protective dose 6 per cent., and after subcutaneous injection 11 per cent. of positive

Dick re-tests at a 24-hours' interval subsequently became negative, whereas after a 48-hour re-test further change in the reaction was unlikely. We are therefore inclined to recommend the intramuscular route to secure as rapid absorption as possible, and that a 48-hour interval be observed before re-testing to estimate the effect of immunisation.

Duration of Passive Immunity.

This is a matter of some importance and, on the analogy of other infections in which it is possible to produce this type of protection, we should not expect it to be of long duration. It is generally considered that, to be of value, passive immunity in scarlet fever should at least endure beyond the limit of the incubation period—i.e., for 7–10 days. On consulting the table it can be seen how far that demand is satisfied by different doses. For various reasons we were not able to follow up all our cases until they returned to their original positive reaction, but in each series of cases we think we have been able to follow up a sufficient number as far as the end of the second week to supply a satisfactory figure on which to calculate the probable number of negatives if all had been re-tested, and thereby establish a percentage in which the probable error is not great. Again the results vary with such irregularity that it is difficult to draw conclusions. We find that at the end of the first week, after a 3 c.cm. dose 75·4 per cent., and after a 4 c.cm. dose 92·6 per cent. are still negative, but after a 5 c.cm. dose only a little over half, 56·6 per cent., have not relapsed to the state of susceptibility. At the end of the second week there is a further falling off

Table showing Incidence and Duration of Passive Immunity after Various Doses of Scarlet Fever Antitoxin.

Dose: c.cm.	Date of re-test.	Total.	Pos.	Neg.	Negs. not re-tested.	Prob. neg.*	Per cent.
3	1–2 days	57	6	51	—	—	89·4
	1st week	39	6	33	12	43	75·4
	2nd „	24	9	15	9	27	47·3
	3rd „	12	3	9	3	—	—
	4th „	7	3	4	2	—	—
	5th „	4	0	4	—	—	—
4	1–2 days	41	1	40	—	—	97·5
	1st week	39	2	37	1	38	92·6
	2nd „	32	12	20	5	24	58·5
	3rd „	5	2	3	15	—	—
	4th „	2	2	0	1	—	—
5	1–2 days	120	19	101	—	—	84·1
	1st week	95	31	64	6	68	56·6
	2nd „	51	16	35	13	47	39·1
	3rd „	29	13	16	6	—	—
	4th „	10	4	6	6	—	—
10	1–2 days	43	2	41	—	—	95·3
	1st week	36	1	35	5	40	93·0
	2nd „	28	3	25	7	36	83·7
	3rd „	21	8	13	4	—	—
	4th „	6	0	6	7	—	—

* Prob. neg. = Probable number of negatives if all surviving negatives from previous re-test had again been re-tested.

in the numbers, the 3 c.cm. and 4 c.cm. series now showing 47·3 and 58·5 per cent. respectively of negatives, whilst the 5 c.cm. series give a smaller percentage still—viz., 39·1. Again, the 10 c.cm. results are the most satisfactory since, although the percentage of negative results immediately after immunisation is not so high as obtained with the 4 c.cm. dosage, 93·0 and 83·7 per cent. of negatives at the end of the first and second weeks respectively may be regarded as satisfactory. This result also confirms the observation of Cruickshank that increasing the dosage for passive immunity in scarlet fever tends rather to prolong the duration of protection than to give a great increase in the number of negative reactions. It may be fair to attribute the better results obtained in the 3 c.cm. and 4 c.cm. series, when compared with the 5 c.cm. series, to the smaller total numbers involved, and if we do so, then we must regard the 10 c.cm. series as the only satisfactory one from the point of view of persistence.

During the course of the investigation eight case previously passively immunised subsequently deve loped scarlet fever, and, since these have a direc bearing on the protective value of the process an also on the duration of the immunity, details ar appended :—

CASE 1, aged 5. Exposed on Feb. 9th, 1928, and foun Dick-positive. On the 10th given 5 c.cm. antitoxin. O the 12th was still Dick-positive and developed scarlet feve on that date—i.e., two days after immunising injection.

CASE 2, aged 6. Exposed Feb. 6th, 1928, and found Dick positive. On the 10th given 5 c.cm. antitoxin. On the 12t was Dick-negative and developed scarlet fever on that dat —i.e., two days after immunising injection.

CASE 3, aged 10. On Oct. 27th, 1927, was Dick-positive Exposed Nov. 16th. On the 17th given 5 c.cm. antitoxin On the 18th was Dick-positive and on Nov. 21st took scarle fever—i.e., four days after immunising injection.

CASE 4, aged 15. Exposed Dec. 13th, 1926, and foun Dick-positive. On the 14th 3 c.cm. antitoxin. On th 15th and 21st was Dick-negative. On the 24th was Dick positive and took scarlet fever—i.e., ten days after immunisin injection.

CASE 5, aged 3. On March 24th, 1927, was Dick-positive Exposed April 14th. On the 15th given 4 c.cm. antitoxin Was Dick-negative on the 16th and 21st, but Dick-positiv on the 28th. On May 3rd took scarlet fever—i.e., 19 day after immunising dose.

CASE 6, aged 8. On July 20th, 1927, was Dick-positive Exposed on the 22nd. On the 23rd given 5 c.cm. antitoxin August 1st was Dick-negative, but found Dick-positive o the 8th. On the 12th took scarlet fever—i.e., 20 days afte immunising dose.

CASE 7, aged 2. Exposed April 15th, 1928, and foun Dick-positive. On the 16th given 5 c.cm. antitoxin. On th 18th was Dick-negative, but on the 25th and May 2nd wa Dick-positive. On the 9th took scarlet fever—i.e., 23 day after immunising dose.

CASE 8, aged 7. On Oct. 27th, 1927, was Dick-positive Exposed on Nov. 16th. On the 17th given 5 c.cm. antitoxin On the 18th was Dick-negative, but on the 25th and Dec. 2nd was Dick-positive. On the 15th took scarlet fever—i.e. 28 days after immunising dose.

It is interesting to note from these cases that in al except the second the presence or absence of immunity was correctly indicated by the Dick test. It is difficult to explain Case 2, except on the ground that it probably falls into the varying percentage of cases of scarlet fever which practically all workers have found to be Dick-negative even in the earliest stages of the disease. We suggest that the first three cases were incubating scarlet fever at the time of immunisation, and that the protective injection of 5 c.cm. of antitoxin did not succeed in blocking the onset and apparently failed to have much effect in modifying the incubation period, assuming that all three were the direct consequence of their respective primary infecting cases. All cases, however, were mild and without complications. Whatever the explanation, their occurrence seems to point to the necessity for a serum which in reasonably small doses will confer a more certain immunity. The remainder of the cases serve to emphasise the fact that, while passive immunisation may carry the susceptible contact over the immediate dangers of an exposure, it is transient and fails to protect against subsequent exposures at as short a space of time as three or four weeks after the first.

Comparison of Quarantine and Immunisation Methods.

In 21 of the 40 outbreaks studied the usual methods of quarantine for ten days were carried out. Of these 11 ended without further cases developing within the quarantine period, but in ten instances secondary cases appeared, resulting in the infection of 13 individuals. In the 19 outbreaks dealt with by passive immunisation 17 were free from the occurrence of subsequent cases within ten days of the appearance of the primary case. In two outbreaks, however, secondary cases did appear. These numbered three, one outbreak being responsible for Cases 1 and 2 detailed above, and another for Case 3. These figures give a clear indication of the protective value of passive immunisation and constitute a strong argument

its favour. Perhaps less important than the actual revention of cases of scarlet fever, but nevertheless of nsiderable moment to those responsible for hospital dministration, is the saving in accommodation. By ducing the period of quarantine from ten to three ays, the time occupied by testing and immunising, ere was a clear saving of seven days in each of 9 outbreaks, or a total of 133 days—i.e., roughly ur and a half months in two years. If the quarantined outbreaks had been immunised as well we should ave been able to double that gain, so that the uivalent accommodation of one ward for four and half months in one year would have been set free.

Serum Reactions.

Since the majority of our scarlet fever cross-infections curred amongst diphtheria patients who had been nsitised to horse serum, it was inevitable that there ould be a fairly heavy incidence of serum reactions. or the same reason it was often quite impossible to etermine whether to attribute any given rash to the erapeutic diphtheria antitoxin or the scarlet fever ophylactic, and we cannot offer any statistical vidence on this point. When patients had received phtheria antitoxin more than ten days previously ey were desensitised by an injection of 0·5 c.cm. of rmal horse serum. Serum sickness was confined to cal reactions and generalised urticarial rashes, and, hile inconvenient, the symptoms were transient and o serious effects were produced.

Discussion.

This phase of development of the recent work on carlet fever has not by any means reached finality. We had hoped to be able to outline a plan which ould be adapted to any outbreak and which, volving no more trouble than a preliminary Dick st followed by the immunising dose, could be relied pon to give a solid immunity of a reasonable duration. xperiment has shown that the problem of passively mmunising the susceptibles in an exposed ward-opulation cannot yet be reduced to these terms, and seems to us that the chief part of the difficulty is ue to the fact that we are working with a relatively eak antibody. This is apart from the handicap posed by the fact that no method of standardisation as yet been evolved which can provide us with n exact measure of the antitoxic content. In spite these limitations we think the case for passive mmunisation is strong. It is true that the present pe of scarlet fever is mild, but in the past we have en death resulting from scarlet fever complicating her acute infections and also such operations as that r cleft palate. If we add the administrative advanges in the saving of hospital accommodation, and conomic advantages to adult patients in the avoidance loss of working-time, we consider that this procedure rovides an opportunity which no one can afford to ismiss.

The results in attempts to limit outbreaks of scarlet ver by passive immunisation are encouraging, but mplete efficiency requires the introduction of an ntiserum comparable in potency with that of phtheria antitoxin. At present we suggest that sceptible contacts up to the age of ten years giving Dick reaction of less than 30 mm. diameter should ceive 5 c.cm. antitoxin intramuscularly and should e Dick-tested again after 48 hours, the dose to be peated in positive reactors. Contacts over 10 years age and those of any age giving a reaction of) mm. or over should receive an initial dose of) c.cm.

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OBSERVATIONS ON THE SEDIMENTATION RATE IN PULMONARY TUBERCULOSIS.

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IN November, 1926, we began an investigation to determine the value of the sedimentation rate in the diagnosis and prognosis of pulmonary tuberculosis. The method adopted was that used by the late Dr. Arthur Inman, of Brompton Hospital, which differs from the usual methods in that very small amounts of blood are taken, permitting frequent examinations over long periods. Various methods of treatment were thus investigated—ordinary sanatorium routine, artificial pneumothorax, and sanocrysin.

Technique.

To two volumes of a sterile solution of 3·8 per cent. sodium citrate eight volumes of blood are added. The unit of volume is one drop of blood from a broad-ended glass pipette; the blood is drawn from an ear or finger and mixed in a watch-glass. A column of the diluted blood, 4 inches (=100 mm.) long, is drawn by capillary attraction into a fine glass tube about 6 inches long and of 2 mm. bore. The tube is sealed with sealing wax and placed vertically in a bed of plasticine. In this investigation the length of the clear fluid column above the sedimented red cells was measured at the end of an hour, in millimetres, this giving the result directly as a percentage. Any reading above 6 mm. for a man and 12 mm. for a woman is considered abnormal. In cases investigated over a long period the results were plotted in graph form (Fig. 1).

All cases entering the sanatorium were investigated a week after admission and at monthly intervals until discharged. Cases undergoing pneumothorax treatment were investigated once a week for the first month and afterwards every fortnight.

The Test in Diagnosis.

It has been proved by many investigators that the sedimentation test has little value in diagnosis and this agrees entirely with our findings. Of the 360 cases who entered the sanatorium during the period covered by the investigation 318 were clinically tuberculous, while in the remaining 42 no positive evidence was obtained. In these patients the changes in the sedimentation rate were as follows:—

A. *Clinically Tuberculous Cases.*

Sputum.	Sed. rate. Normal.	Sed. rate. Increased.	Total.
T.B. + ..	3	230	233
T.B. — ..	6	79	85
All cases	9	309	318

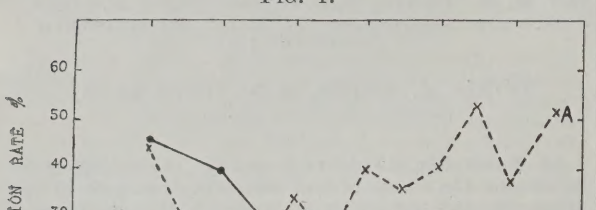
B. *Clinically Non-tuberculous Cases.*

—	Sed. rate. Normal.	Sed. rate. Increased.	Total.
Nil found ..	18	3	21
Other chest conditions..	8	7	15
Non-pulmonary conditions..	3	3	6
All cases ..	29	13	42

Thus, of 318 clinically tuberculous cases, 309, or 97 per cent., gave an increased sedimentation rate, while 9, or 3 per cent., gave a normal figure. Of the 42 clinically non-tuberculous cases, 29, or 69 per cent., gave a normal figure, while in 13, or 31 per cent., the rate was raised. These results indicate that, while an increased sedimentation rate may be used in conjunction with clinical findings to assist in the diagnosis of pulmonary tuberculosis, yet its usefulness in this respect is more than modified by the fact that other

chest conditions give a high percentage of positive results, while a definitely tuberculous case may give a normal figure; this is repeatedly demonstrated in cases after treatment. On the other hand, in its

FIG. 1.



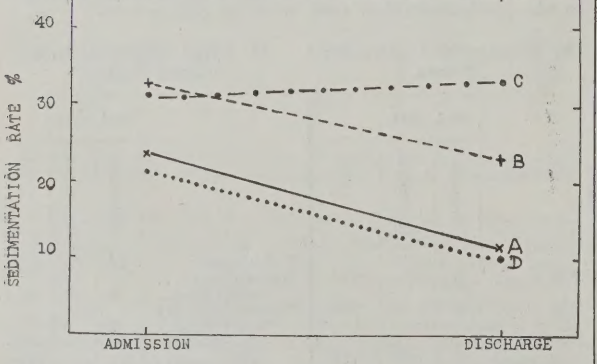
Illustrating cases (A) failing to respond to treatment, and (B) making satisfactory progress.

indication of response to treatment the test seems to have definite and unique value, and thereby to justify its use. Both in following up the progress of individual cases and in observing the results of treatment on patients as a whole a marked correlation has been found between the fluctuations in sedimentation rate and the clinical findings. This has been shown to hold good for all types of cases and treatments; the figures obtained bring out some interesting features.

Ordinary Sanatorium Routine.

One hundred cases, sputum "T.B. positive" on admission and under ordinary routine treatment only were observed over a period of not less than four months. On their clinical condition on discharge these patients fall into three classes: (A) Improved and arrested, with "T.B.—" sputum. (B) Improved but still with "T.B.+" sputum. (C) Stationary or worse. The average fall in sedimentation rate for the 100 patients was from 28 per cent. on admission to 22 per cent. on discharge, a definite but by no means striking improvement. The following graph illus-

FIG. 2.



trates, however, the difference in the degree of improvement according to the class of case (Fig. 2).

In Class A the fall in sedimentation rate (23 per cent.–12 per cent.) is very definite and practically reaches the normal on discharge; Class B shows an equally good fall in sedimentation rate (32 per cent. –22 per cent.), but begins and ends on a much higher level; Class C shows no improvement (31 per cent. –32 per cent.). A further graph, Class D, is added for comparison; it is based on 30 cases, "T.B. negative" on admission. This line is almost parallel with that of Class A.

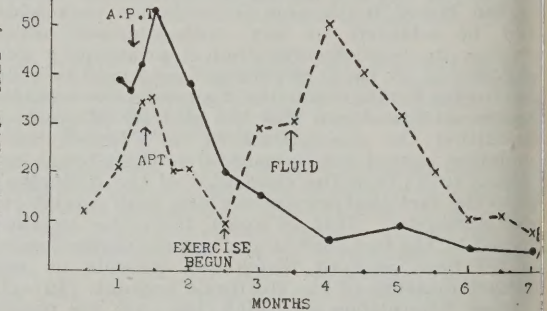
Isolated readings are useless owing to the rapi and striking reflection in the sedimentation rate such complications as dry pleurisy, onset of fluid i a pneumothorax case, mental shock, &c. Eve minor causes, such as worry, colds, falls, cauterisatio of the larynx, teeth extraction, &c., though they d not affect the temperature chart will temporaril upset the sedimentation readings. But, allowing fo these complications, if readings are taken at regula intervals the general trend of the sedimentation rat indicates clearly whether or not the progress of th patient is satisfactory. Fig. 1, which shows tw typical cases, might be multiplied indefinitely.

Special Treatment.

It is of the greatest interest to follow the change in the sedimentation rate in patients undergoin special treatment; this has been done most thoroughl in artificial pneumothorax cases. Typically in suc cases there follows a slight rise of varying intensity due perhaps to worry and shock, perhaps to sudde increase of auto-inoculation from the pushing dow of the diseased lung. This, in an uncomplicate case, generally precedes a steady fall to a norma level (Fig. 3 (A)).

The first exercise following the absolute res enjoined in the early stages in all cases of pneumo thorax treatment produces a slight rise in the sed

FIG. 3.



A.P.T. = artificial pneumothorax.

mentation rate, soon corrected and often repeate with increasing movement. As previously mentioned the onset and withdrawal of fluid invariably cause startling increase (Fig. 3 (B)). In one case a figure over 70 per cent. was reached with the onset of pleural effusion, but the patient left the sanatoriu with a normal sedimentation rate. The average fa in the sedimentation rate of the 20 pneumothora patients who have been induced and left the sana torium during the period under consideration is fro 31 per cent. to 14 per cent., a very satisfactor drop when it is realised that the majority of thes cases were tried first on routine treatment withou success.

Sanocrysin has been given to 11 patients who, afte improving, have hung fire and whose sputum ha remained "T.B. positive" in spite of at least fou months' treatment. As in pneumothorax patient the initial change in the sedimentation rate is definite rise followed, in satisfactory cases, by a fal The average fall of sedimentation rate in the case treated was from 20 per cent. to 10 per cent., figure which should be compared with those for Group I since the patients seemed likely to remain in thi category without special treatment. In six of th 11 cases the sputum became "T.B. negative" an remained so for a month before discharge, durin which time three examinations were made, while i several other patients improvement was obtained.

Cases under light treatment were also closel followed for a time, but no conclusive results hav been obtained.

Conclusions.

The simplified technique used in this investigation renders the test a simple and convenient aid in the summation of the individual case. The fallacies of the test as a diagnostic measure have been shown, but the prognostic significance of both the initial figure and its subsequent fluctuations is equally clear. Experience over the past two years has shown us the wisdom of a guarded prognosis in a pulmonary (not pleural) case, otherwise encouraging but with a high initial sedimentation rate—over 30 per cent.; nearly half these cases do not respond satisfactorily without special treatment. On the other hand, cases with a sedimentation rate of under 30 per cent. have a much more favourable outlook, and this appears to be independent of the initial presence or absence of bacilli in the sputum. The close relationship of the curves A and D in Fig. 2 is very striking. The changes in sedimentation rate during the first three months in the sanatorium indicate not only whether or not the patient is responding to treatment, but the rate at which this improvement is taking place and therefore the ultimate chance of recovery in the sanatorium. The figure obtained after four to five weeks' treatment is often as high as or a little higher than the initial figure; this happens repeatedly in patients whose progress is perfectly satisfactory and must therefore be discounted, but after this a rising sedimentation rate means lack of response and suggests the advisability of considering further treatment.

During pneumothorax treatment, after hæmoptysis, when giving gold, and in the initial stages of exercise, the sedimentation rate can be used to follow the progress minutely, and often indicates the onset of complications before these are otherwise apparent.

If the significance of its changes and their degree in the individual case can be accurately gauged, it appears to us that the test is of outstanding assistance to the clinician in his most difficult tasks—the evaluation of treatment and the formulation of prognosis.

Clinical and Laboratory Notes.

A CASE OF DISSECTING ANEURYSM OF THE AORTA.

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AND
JOHN F. TAYLOR, M.D. CAMB.,
LATE ASSISTANT PATHOLOGIST TO THE HOSPITAL.

THE following case seems worth recording on account of the rarity of the condition and of the difficulty in making a diagnosis.

A clerk, aged 32, was admitted to St. Thomas's Hospital on July 26th, 1928, complaining of difficulty in swallowing. He had been through the late war, but was never wounded and had never sustained any serious injury. He had, however, had cerebro-spinal fever in 1916, nephritis in 1917, and pneumonia in 1919. About June, 1925, he began to suffer from "indigestion," consisting chiefly of epigastric pain two hours after food. The pain was sometimes "stabbing," and was felt in the lower part of the chest, more on the left side than the right. Operation for presumed gastric ulcer was undertaken at Woking Hospital in November, 1927. The patient, however, collapsed under the anæsthetic, and the abdomen was closed without investigating its contents. About the time of this operation he commenced to have some difficulty in swallowing; this persisted, and since the middle of June, 1928, he had become rapidly worse.

On admission to St. Thomas's Hospital no solid food could be swallowed, being returned at once unchanged. Some pain in the upper right chest was complained of. In appearance he was pale and thin, and looked ill. There was an area of dullness to percussion and absent breath sounds over the left base behind; the air entry over the whole of the left lung was diminished. The second aortic sound was much accentuated; the blood pressure was 135/85. There was a paramedian scar in the upper abdomen; no abnormal physical signs were discovered in the abdomen or in the nervous system. There was some pyrexia, ranging up to 101° F. Screen and film examinations with X rays showed a shadow passing out from the mediastinal shadow into the left lung area at the level of the bodies of the fourth to eighth dorsal vertebræ. No pulsation could be seen in the shadow. On swallowing opaque fluid it was seen that the œsophagus was displaced forwards and to the left, being stretched over the tumour and thereby partially obstructed.

The blood showed a leucocytosis of 17,200, polymorphs being 75 per cent. A Wassermann reaction was negative.

The Operation.

The diagnosis of aneurysm appeared very unlikely and exploration was decided upon, with a provisional diagnosis of mediastinal abscess, or possibly neoplasm. On August 1st, under intra-tracheal ether, the tumour was approached by a left posterior costo-transversectomy, removing the posterior two inches of the fifth, sixth, and seventh ribs, together with the corresponding vertebral transverse processes. The exposed parietal pleura was found to be pressed back by a firm hard mass in which no pulsation could be detected. Aspiration of this mass through the pleura withdrew no fluid. The posterior reflection of the pleura was gently separated from the sides of the vertebral bodies, where the exploring finger dropped into a large cavity. On withdrawing the finger there was a big gush of blood under considerable pressure, but hardly the pressure that would have been expected in an aneurysmal cavity communicating directly with the aorta. The colour, too, was a little less bright than that of the normal arterial blood. The hæmorrhage was arrested with gauze plugging, and the wound sutured without much blood having been lost.

The patient was nursed flat on his back, and kept well under morphia for the first 24 hours after operation. On August 3rd there was very little oozing from the wound, and the patient was comfortable and said that he could swallow better than before operation. On August 4th the wound was reopened under ether, it being hoped to replace the gauze plug with a muscle-graft sutured in position; but this proved impracticable as hæmorrhage became uncontrollable as soon as the gauze plug was disturbed. The tumour was again aspirated through the pleura; this time the syringe rapidly filled with blood, the piston being pushed forcibly back by the pressure. Hæmorrhage was again arrested by plugging and the wound partially closed. On August 6th he was able to swallow and his general condition was fair, but he complained of some pain. No blood was coming from the wound. On the 7th he twice vomited a little blood and became rapidly weaker; he died on the 8th.

Post-mortem Examination.

On reopening the operation wound little hæmorrhage was found. The floor of the cavity thus exposed showed a mass of laminated clot, bounded on the left by the pleura and on the right by the thoracic vertebræ, to which the clot was firmly adherent. No destruction of bone was found.

On exploring the body from the front a dissecting aneurysm was found, extending from the arch to the bifurcation of the aorta, and giving the appearance of a double aorta. The total length of the sac was 29 cm., its largest diameter was 5 cm., near its upper end, whence it tapered to 3 cm. at the diaphragm, and 1½ cm. at the lower end. The aorta was almost surrounded by the sac. In the middle of the thorax the sac had expanded into the cavity already described, limited by the vertebræ and pleura, and lined by laminated clot, some old, some recent. The thoracic part of the sac contained a considerable amount of old laminated clot and a small quantity of fluid blood, the abdominal part of the sac contained very little clot.

On slitting the aorta the intima was quite smooth and showed no evidence of disease. At the junction of the arch and descending aorta was a sharply raised ridge crossing the vessel transversely for a length of 1 cm. This ridge presented a sharp edge quite firm to the touch and suggested a fibrous scar. The lining of the sac, when stripped of its clot, showed a somewhat irregular yet smooth surface. 4 cm. below the diaphragm was a circular orifice 3 mm.

in diameter, with smooth rounded edges, connecting the aorta with the sac. The left bronchus was compressed and considerably narrowed by the sac; the lower lobe of the left lung showed deposits of fibrinous pleurisy, patches of broncho-pneumonia, and considerable areas of collapse. At the level of the crossing of the left bronchus there were two small perforations of the sac into the œsophagus, from which blood was oozing. The lower part of the œsophagus, the stomach, and the upper part of the small intestine contained several pints of fluid blood; death was due to this hæmorrhage. The heart was normal and no arterial disease was found elsewhere.

Microscopical Examination.—The ridge in the aortic arch showed a sharply defined fibrous scar extending through all the coats of the vessel; in the deeper part a collection of calcareous granules was present; beyond the scar tissue the aortic wall was normal. A section taken just above the bifurcation showed a healthy aortic wall stripped of its adventitia, which thickened and fibrous formed the wall of the sac. The sac was lined by a new intima.

It is suggested that the aneurysm started through a linear tear in the aortic wall at the junction of the arch and the descending aorta, which subsequently healed; and that communication between the aorta and the sac had been maintained through the round orifice below the diaphragm. The origin of this second opening is not clear, nor is any suggestion offered to account for the original cause of the lesion in the aorta.

We are indebted to Mr. Cyril Nitch for permission to operate upon and publish this case.

A CASE OF RUPTURE OF THE UTERUS.*

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THE following case has some interesting features:—

The patient, a woman aged 34, who had had two children previously, was admitted to St. Mary's Hospital, Manchester, after the first of twins had been delivered by natural forces. The second twin was impacted, the hand and cord being prolapsed. Attempts at delivery by version had been made without success.

On admission the patient was in good condition with a pulse of 102. On abdominal examination the most obvious feature was the prominence of a fœtal limb to the left of the umbilicus. This was easily identified as a leg and the possibility of rupture of the uterus was discussed, but was ruled out owing to the excellence of the patient's general condition, the suggestion being made that the uterine wall was extremely thin from distension by twins and hydramnios. The pelvic measurements were normal. Vaginal examination revealed a prolapsed hand and foot and an umbilical cord which was not pulsating. There was no bleeding.

Under anæsthesia, delivery of the child was effected without difficulty by traction on the presenting foot. There being no abnormal amount of bleeding after this manœuvre, the patient was left to deliver the placenta herself. On palpation of the uterus abdominally a rather puzzling state of affairs was found. The impression gained was that the placenta had left it, but downward pressure failed to push it out from the vagina, and on drawing the uterus upwards the cord shortened. It was therefore presumed that the placenta was still in utero. After an hour's time there was no sign of the placenta, the patient's condition was not too good, but there was no cause for alarm. After two hours she was beginning to show signs of shock, and as there had been a little bleeding, a further anæsthetic was given to allow manual removal to be performed.

On introducing the hand into the uterus no placenta could be found, and one became aware of a large rupture of the anterior wall of the lower segment. The cord was therefore cut off short, the vagina carefully swabbed out with antiseptics and packed with sterile gauze, and the patient, who was by now in rather a critical state, was removed to the theatre.

On opening the abdomen the missing placenta was found in the region of the spleen. There appeared to be quite a negligible quantity of blood in the abdominal cavity, less than an ounce in fact, and there was no bleeding from the torn uterus which was well contracted, but it was deemed advisable to perform hysterectomy. This was done rapidly by the ordinary subtotal technique, except that an opening was left in the cervix for drainage. The pelvis was peritonised, the abdomen mopped out, and the abdominal wall sutured in layers, without drainage.

Intravenous saline was given and the patient treated for shock on the usual lines, but she was placed in Fowler's position as soon as it was deemed advisable. She had a swinging temperature and some vaginal discharge for a week following operation, but the abdominal wound showed no signs of suppuration, and she was able to proceed home within three weeks.

The points of interest in this case seem to be: (1) The small amount of hæmorrhage, due presumably to the situation of the tear, and in contrast, the present writer saw a case about a month later where a woman was admitted to hospital with a breech born as far as the head which was hydrocephalic. While the instruments were being boiled the patient suddenly cried out, collapsed, and was dead within ten minutes. Post-mortem examination revealed a tear through the uterine artery. (2) The fact that one of the child's legs was probably projecting through the rupture into the abdominal cavity when the patient was admitted and would have given the diagnosis had her condition not been so good. (3) That the placenta and membranes should be delivered into the cavity of the abdomen. (4) The delayed onset of shock which did not appear until six hours after the rupture had taken place. This case is reported by courtesy of Dr. J. W. Bride.

* Communicated to the North of England Gynæcological and Obstetrical Society on Oct. 26th, 1928.

A CASE OF FAMILIAL HÆMOLYTIC ICTERO-ANÆMIA.

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AND
ADRIANUS PIJPER, M.D. LEIDEN,
PATHOLOGIST TO THE PRETORIA HOSPITAL.

THIS case is recorded because, as far as we know, it is the first properly observed case of this nature amongst the older white population of South Africa, and also because we want to make it more widely known that the diffraction method of measuring red cells provides an easy and reliable means not only of establishing a diagnosis, but also of tracing the hereditary character of the disease to its origin.

The patient was a girl, 23 years of age, looking well nourished and not obviously ill, apart from a definite icterus. As far back as she could remember her complexion had always been sallow. She had always been easily tired, and had never felt well. When still quite a child she had experienced attacks of pain in the upper part of the abdomen. Since then she had had several attacks of severe pain in the region of the gall-bladder. Various medical men were consulted from time to time, and she was treated for malaria, pernicious anæmia, and cholecystitis.

On the first occasion that she consulted us she had been to a dance, and on her arrival at home had been seized with acute pain over the gall-bladder. The attack was typical of gall-stone colic. During the next few days she had several attacks, and we found great tenderness over the gall-bladder, which could not be felt. The liver was not obviously enlarged, but the spleen was greatly enlarged, extending to the right almost to the middle line and downwards almost to the left iliac crest. The surface was smooth. There was nothing in the family history to suggest familial hæmolytic jaundice. Examination of a blood-smear, in order to settle the question of Addisonian (pernicious) anæmia by means of the diffraction micrometer, revealed a marked microcytosis. With the present instrument the diameter of the red cells in normal persons is found to be 7·3 microns, with individual variations, which, however, do not exceed 0·4 micron. The patient's red cells measured 6·4 microns. This at once established the diagnosis of hæmolytic jaundice, and a complete blood examination showed: hæmoglobin, 52 per cent.; red cells, 3,500,000; reticulocytes, 14·5 per cent.; hæmolysis, beginning at 0·7 per cent. and complete at 0·4 per cent.; van den Bergh's test direct negative, indirect positive; polymorphonuclear leucocytes, 72 per cent.; small lymphocytes, 22 per cent.; large mononuclear leucocytes, 5 per cent.; eosinophils, 1 per cent.; Wassermann reaction negative. This constituted a perfectly typical picture.

Splenectomy was performed a few days later. The abdomen was opened under local anæsthesia, and the patient was then put under light general anæsthesia. The incision was made half an inch to the left of the mid-line. A few adhesions on the posterior surface of the spleen were freed. The pedicle presented no great difficulty, and the spleen was removed in the usual way. Three accessory spleens were found and were also removed. The gall-bladder was found to contain a large number of stones. Cholecystotomy was performed, and the stones (30 to 40 in number) removed. The gall-bladder was closed without drainage. The stones ranged in size from that of a small pea to a pigeon's egg, one of the larger stones being found in the common duct. Cholecystectomy was decided against, as the patient's condition on the table at this stage was not satisfactory. The abdomen was closed without a drain, and the wound healed by first intention.

The spleen weighed 881 g., the accessory spleens together weighed 5 g. They were all dark purple and extremely congested, the cut surface was deep red, and the Malpighian corpuscles sparse and indistinct. The accessory spleens showed all the changes present in the large spleen, but to a lesser degree. The trabeculæ were not conspicuous, and the arteries often showed thickened dense white walls. Microscopically the pulp was filled with blood, and the lymph follicles were spare and often without germ-centres. The reticulum was scanty, and the sinuses relatively empty and collapsed and lined with the peculiar endothelial cells described by Meulengracht, containing large, round, prominent nuclei and standing packed side by side. Pigment was distributed throughout all the elements of the spleen. That part of it which gives an iron reaction was found in sinuses, in pulp-cells, and in the intima of many arteries. In the sinuses it showed a honeycomb appearance, as if the spaces between a number of blood-cells had been stained and the cells themselves had disappeared. In the pulp the pigment was diffused through the whole protoplasm. The largest amount of iron pigment was in the arterial walls, and it was present in many elastic tissue strands.

A week after the splenectomy the hæmoglobin had risen to 85 per cent. and the red cells to 4,500,000, but there were still 14 per cent. reticulocytes; van den Bergh's test was still indirectly positive, and the diameter of the red cells had increased to 6·6 microns. Sixteen days after the operation the hæmoglobin reached 98 per cent., the red cells remaining at 4,500,000, whilst the reticulocytes had come down to 7 per cent. The van den Bergh's test was then negative, and the red cells showed a further increase in diameter, measuring 6·7 microns. A final examination was made one month after the operation. The hæmoglobin was then 100 per cent., the red cells 5,360,000, with 9 per cent. reticulocytes, van den Bergh's test giving a faint indirect positive. Hæmolysis started at 0·46 per cent. saline, and was complete at 0·3 per cent. saline. The red cells again measured 6·7 microns. Clinically the patient was perfectly well and very pleased with what had been done. It is, of course, well known that splenectomy in these cases has a marked beneficial and lasting effect, but that it does not altogether abolish the objective signs of the disease.

The familial nature of the disease in this case could be investigated through the active coöperation of the family physician, Dr. I. Rosenberg, who kindly prepared blood smears of the nearest relatives. Upon measuring their blood-cells by means of the diffraction micrometer it was found that the mother of the patient showed the quite normal diameter of 7·3 microns. The father's cells, however, measured 6·6 microns, one brother's 6·8 microns, another brother's 6·7 microns, a sister's 6·8 microns, and a paternal uncle's 6·9 microns. An inquiry into the medical history of the relatives on both sides, undertaken by Dr. Rosenberg, was quite negative, except in the case of the father. His history mentioned an attack of "inflammation of the liver," and later an attack of jaundice, supposed to have been "catarrhal."

Without going into the controversy about the relationship between microcytosis and the pathology of the disease called familial hæmolytic icterus, it seems quite obvious to us that our case contained a hereditary element, and that this was inherited through the father, and was present in the father's blood relations and absent in the mother, and that the presence of this hereditary character expresses itself in the average diameter of the red blood-cells, as measured by the diffraction micrometer.

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Medical Societies.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

AN EXPERIMENTAL STUDY OF YELLOW FEVER.

Prof. EDWARD HINDLE, Sc.D., the Beit Fellow in Tropical Medicine, gave a lecture to this Society on Jan. 17th, describing his recent work on yellow fever in monkeys, with special reference to the method of vaccination discovered by him, and to other aspects of prophylaxis.

He began with a brief account of the present distribution of yellow fever, drawing attention to the fact that West Africa is now the main endemic centre of the disease. After referring to the discovery by Stokes, Bauer, and Hudson that Asiatic monkeys, and especially *Macacus rhesus*, could easily be infected, he described the way in which he succeeded in getting the virus of the disease brought back to London by Dr. Andrew Sellards. With the liver of an infected monkey that had been kept frozen during the voyage from Senegal to London, a period of 12 days, the disease was reproduced in this country, in a rhesus monkey, at the end of March, 1928. Since that date the strain had been maintained at the Wellcome Bureau of Scientific Research and had been the subject of the experiments and observations to be described. This strain of yellow fever had been isolated from a Syrian at Dakar, who suffered from a very mild attack, yet in monkeys the disease had shown a very high degree of virulence, the animals almost invariably succumbing to the infection. As a general rule transmission from one monkey to another was effected by the subcutaneous inoculation of a small quantity of infected liver, ground up in normal saline. In a series of 50 monkeys inoculated with fresh virus there was not a single recovery, except when sublethal doses were employed. The liver, spleen, and kidney of monkeys dying of the disease were found to contain variable amounts of virus, ranging from 1000 to 100,000 minimum lethal doses per gramme. The inoculation of 0·0001 g. of infected tissue was usually as effective as 1–2 g. in producing the disease, but when doses of 0·00001 g. were employed the incubation period was lengthened. In two instances the inoculation of this dose caused no rise in temperature nor any other signs of infection, yet the animals were found to have been immunised, and subsequent inoculations of very large quantities of virus had no effect.

In monkeys an incubation period, usually of three days, was followed by a rise in temperature of about 2° F., which lasted for 36 to 48 hours, succeeded by a sudden drop to subnormal, and the death of the animal about five days after being inoculated. The symptoms in monkeys dead of the disease, with the exception of minor differences, resembled those in human patients.

It was found that the frozen virus preserved its virulence for about 18 days, after which period it acted as a vaccine. Thus animals inoculated with the liver of infected monkeys, kept frozen for one to three months, showed no sign of infection but were immune against subsequent inoculations of fresh virus. Similarly, it was found that the virus could be dried in vacuo, and, if kept absolutely dry, preserved its virulence for at least four months, and probably longer. If, however, this dried virus was exposed to moist air, it gradually lost its virulence and could then act as a vaccine.

Mosquito Transmission.

Prof. Hindle described his technique of handling infected mosquitoes and then gave the results of his transmission experiments in this country with both

an African and Indian race of *Aëdes aegypti* (*Stegomyia fasciata*). The disease, he said, was readily transmitted to monkeys by the bites of mosquitoes that had fed on an infected monkey at least nine days previously. Both races of mosquitoes could carry the infection, but there was a suggestion that the Indian race was a little less susceptible than the African one. In addition, experiments were described showing that insects might harbour the virus without producing infection by their bite. This was the first proof that the Indian race of *Aëdes* is capable of transmitting yellow fever, and now there could not be any doubt that if by any ill chance the disease ever reached the Orient, the local race of mosquitoes could serve as an efficient carrier. The stringent quarantine regulations concerning this disease were fully justified by the results of these experiments.

Immunity.

It had been known from early times in the history of the disease, Prof. Hindle continued, that an attack was followed by a high degree of immunity, and the serum of convalescent patients, if inoculated into monkeys, would protect them against infection for about one month. The presence of active immune bodies in the blood of recovered patients furnished a means of finding out whether a person had had the disease, for it was only necessary to inoculate a rhesus monkey with the serum of a suspected convalescent case and at the same time with yellow fever virus. By this means in West Africa the Rockefeller Commission had detected the existence of yellow fever in villages where no obvious signs of the disease were present.

Employing these methods the nature of two atypical cases of yellow fever contracted in the laboratory had been discovered. In both patients (the lecturer and his laboratory attendant) the symptoms, a sharp fever of short duration, had closely simulated and at the time were attributed to influenza. After the fever, however, in both cases the blood contained immune bodies against yellow fever, as tested by inoculation into monkeys, and therefore there could be no doubt about the nature of the attacks. It might be added that jaundice and albuminuria, although looked for, were not detected, and the only characteristic symptom was hyperæsthesia of various parts of the body in one patient, which persisted for three to four weeks. These results, combined with the production of immunity by the inoculation of sub-lethal doses of virus, furnished additional evidence in support of the view that mild cases of yellow fever might occur which presented none of the ordinary symptoms of the disease. These cases would never be recognised in the ordinary course of events, but would be capable of infecting mosquitoes that fed on them and thus maintaining the infection in a latent or hidden form.

It was an interesting example of tissue immunity, said Prof. Hindle, that the liver and spleen of monkeys that had recovered from yellow fever, when inoculated into normal monkeys in 1·0 g. doses, was found to immunise them against subsequent inoculations of fresh virus. The brain, kidney, and lymphatic glands of convalescent monkeys did not possess this property.

The inoculation of hyperimmune serum into infected monkeys, after the commencement of fever, was found to have no obvious effect on the course of the infection and consequently doubt was expressed as to the value of serum treatment in human cases of yellow fever. Hyperimmunised monkeys, when inoculated with large doses of infected liver, were found to succumb within 48 hours to a peculiar type of anaphylaxis. Ordinary immunised monkeys were unaffected by the inoculation of similar doses.

Vaccination.

Great hopes had been placed on Noguchi's vaccine prepared from *Leptospira icteroides*, supposed by him to be the causative organism of yellow fever. It was now known that this organism was identical with that of Weil's disease (spirochætosis icterohæmorrhagica), therefore the vaccine prepared from it could hav no value in yellow fever prophylaxis and its use ha now been abandoned. The re-establishment of th earlier view that this disease is caused by a filterabl virus had led Prof. Hindle to apply the methods o vaccination which had proved successful in th production of vaccines against such diseases as fow plague and dog distemper. In June, 1928, he showed that a phenol glycerine emulsion of the liver and splee of infected monkeys conferred a high degree o protection against very large amounts (10,000 t 100,000 lethal doses) of the virus. A formalinise suspension had the same vaccinating property During the past six months these experiments hav been extended, the earlier phenol glycerine vaccin being replaced by a formalinised one, as the injectio of glycerine was painful. The present method o preparing the vaccine was as follows :—

The liver and spleen are removed from an infected monke killed in the last stage of the disease, when the temperatur has become subnormal. These organs are weighed an ground up in a mortar with fine sand. A measured quantit of 9 per cent. salt solution, equal to half the original weigh of these tissues, is added and the mixture allowed to stan for a few hours. Then distilled water is added, equal t nine times the volume of the strong salt solution. As result all the cells are cytolised, liberating the containe virus, and a 20 per cent. suspension of tissue extract i normal saline is obtained. This suspension is allowed t sediment, then filtered through muslin. Part of it is teste for virus content, and a 1 in 10,000 dilution of the origin tissues should produce a fatal infection in a monkey.

The virus suspension is killed by the addition of 2 per 100 formaldehyde and after 24 hours can be used as a vaccine if it passes the usual sterility tests.

Aragão adds 0·5 per cent. phenol to this suspension, i addition to the formaldehyde. Both phenol glycerine an formalinised vaccines, when kept in the ice-chest, have bee found to preserve their properties for some months. Th first has also been dried in vacuo and found to retain it properties.

Monkeys inoculated with these vaccines develope a high degree of protection against yellow fever, an this protection had been tested against the inoculatio of fresh virus and the bites of infected mosquitoe up to four and a half months after vaccination without showing any signs of diminution. In mos cases, about ten days after being vaccinated, th monkeys were inoculated with 0·1 g. infected live material, equivalent to 1000 to 10,000 lethal doses and in some instances with very much greater quan tities of virus. The results of the first series o experiments which were given in detail suggeste that when the amount of virus in the infected monke falls below 10,000 minimum lethal doses per gramme any vaccine made from its tissues gives only partia protection. With tested vaccines a very high degre of protection was obtained, and this in spite of th fact that enormous doses of virus were used to tes the vaccinated animals, *equivalent to at least 100 times the dose which invariably produced fatal infection in normal animals.* In addition the severity of th tests was enhanced by the short interval betwee vaccination and inoculation which was hardly suffi cient to allow the full development of protection.

The lecturer's results had been confirmed, he said by A. Pettit and his collaborators working in Paris and by H. de B. Aragão in Rio de Janeiro, wh used a Brazilian strain of yellow fever. Aragã obtained constant protection in monkeys, and there fore tested the vaccine in human beings, using 20 per cent. suspension of liver, spleen, brain, an kidney containing 2 per 1000 formaldehyde and 0·5 pe cent. phenol. This vaccine was administered sub cutaneously in 2 c.cm. doses to the laboratory worker at the Institute Oswaldo Cruz, with no ill-effects and subsequently used in a small epidemic of yellow fever. Between 300 and 400 people were vaccinated including the health officers working in the infecte neighbourhoods, and people living either in th same house or in the vicinity of yellow fever cases

[1] Brit. Med. Jour., 1928, i., 976.

although no unwarranted conclusions had been drawn it was noted that none of the vaccinated contracted the disease, although some of them must have been exposed to infection. These results were considered so favourable, that the vaccine was now being prepared on a larger scale for use by the Public Health Department of Brazil.

With regard to the position in West Africa it was pointed out that there is an urgent necessity for some additional method of protection against yellow fever, as evidenced by the number of past epidemics, and at present there seemed to be no likelihood of anti-mosquito campaigns succeeding in eradicating all chance of infection. Accordingly, the Colonial Office had decided to give Prof. Hindle's yellow fever vaccine a trial in the West African Colonies, and had invited the Wellcome Physiological Research Laboratories to undertake its production on a large scale.

In conclusion, the lecturer expressed his opinion that by the general use of this vaccine, of proved efficiency in monkeys, there was every hope of yellow fever ceasing to be a source of danger in the world.

Sir JAMES KINGSTON FOWLER, in proposing a vote of thanks to Prof. Hindle, called attention to the work of the West African Yellow Fever Commission of the Colonial Office (1913–15), and pointed out that many of the views expressed in their reports had proved a foundation for subsequent work on the disease.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF PATHOLOGY, SURGERY, AND GYNÆCOLOGY.

A COMBINED meeting of these Sections was held on Jan. 18th with Dr. J. S. FAIRBAIRN, President of the Section of Gynæcology, in the chair, to discuss

POST-OPERATIVE THROMBOSIS.

Dr. W. HOWEL EVANS, in opening the discussion, said the problem of thrombosis was many sided, and a question which had always interested the clinician and the pathologist, in trying to account for post-operative thrombosis, was whether there was any evidence of alterations in the blood which might promote coagulation, and if so, what their importance was in relation to other factors. There was now evidence that some of the factors concerned in coagulation might be disturbed. Dr. Howel Evans wished to extend the consideration to thrombosis occurring after parturition, after fractures, and after acute fevers, such as pneumonia. All these forms presented points of similarity. All were associated with tissue injury and the subsequent absorption of breakdown products; in all there was imposed on the patient a period of enforced restraint or immobility; in all the thrombosis, with or without embolism, occurred some days after the original trauma. And running through all was an increase of the blood-platelets, whilst in some at least there was evidence of an increase of fibrinogen in the blood.

It had long been known that tissue juices contained a thromboplastic material or thrombokinase, which was able to produce coagulation. This it could do by the activation of a mother-substance, prothrombin, in the presence of calcium-ions, in this way forming thrombin, which clotted fibrinogen. Also something in the injured tissue had the power to provoke an increase in platelets and fibrinogen, though the nature and mechanism of those substances seemed at present obscure. It was now clear, too, that conversion of fibrinogen to fibrin was a central feature of the process of coagulation. Blood fibrinogen was also increased during pregnancy. The blood-platelet was a definite kind of cell, arising in the bone-marrow, which was destroyed by the reticulo-endothelial system. By their disintegration these platelets provided material which was intimately associated with the formation of thrombin and the coagulation of fibrinogen. If when blood was shed these platelets were prevented from disintegrating or were filtered off, the blood showed no tendency to spontaneous coagulation. In static thrombi the first step in the building of the thrombus was the adhesion of platelets to the vessel wall, followed later by the formation of fibrin. This adhesion to the wall might be helped by a slowing of the circulation. There was a parallelism between the number of circulating platelets and the tendency to coagulation in the various diseases.

The speaker, with his colleagues, had studied 50 cases following operation, these ranging from minor to large abdominal operations. Before the operation, in most, the platelet count was about the normal, but four to six days after operation it rose, reaching its maximum at about the tenth day, and normal was reached in another ten days. In many cases having a major operation the increase was 100 per cent. to 150 per cent. The age of the patient did not affect the increase, neither did exercise, massage, or movement following the operation. A study of 28 cases following parturition gave a similar result, and the results were most striking following Cæsarean section, as after this operation the platelets rose more quickly, and gave an average increase of 200 per cent., the maximum being reached in ten days. The return to normal was slower than after the other operations. In 11 cases of simple fracture, mostly of the lower limbs, with confinement to bed, a similar curve was seen. A similar observation was made in the case of fevers. From control observations it was evident that the platelet reaction occurred independently of simple loss of blood, anæsthesia, and rest in bed. In sepsis the platelets varied irregularly. The evidence supported the use of post-operative exercises, and Dr. Howel Evans suggested that search might be made for some anti-coagulent substance or drug which would hinder the lysis or reduce the agglutinability of the platelets.

Mr. D. H. PATEY said that four manifestations of post-operative thrombosis were met with—namely, localised thrombosis, massive pulmonary embolism, minor pulmonary embolism, and latent thrombosis. The first two of these were most easily studied and most readily diagnosed. He did not think the tissue juice absorption theory of causation could be supported on the evidence. Neither did he consider that the sitting-up position of the patient after operation was a factor in localising the thrombotic process. One surgeon who, after operation, kept all his patients flat on the back experienced no less a tendency for them to develop thrombosis and embolism. Mr. Patey considered that Dr. Howel Evans's work on the blood-platelets marked a definite advance in knowledge on this subject. But in order to put this theory on a firm basis it would be necessary to furnish unequivocal proof that after splenectomy—the operation after which the rise in the platelets was most marked—there was special liability to thrombosis and embolism. It was a phase of the subject which might well be looked into. Mr. Patey thought that the stasis aspect of the subject—the only one which could in any degree be controlled—offered the most hopeful side for attack. Not only was the inhibition of the diaphragm an important matter, but the question of the effect of the incision on the muscular abdominal wall was equally so. Skiagrams which the speaker exhibited showed distinct inhibition of the diaphragm due to pain, and he said there was no way of getting over that inhibition due to pain, though deep-breathing exercises did much to induce movement in a sluggish diaphragm. Any good effect produced by morphia was spoilt by the lack of tone it caused in muscle. He thought too much attention had been concentrated on the diaphragm in these cases and too little on the abdominal muscle. The effect of the operation on the abdominal wall was two-fold; its tone was diminished, so that it gave a less effective response, and its response was irregular. Much could be done by proper abdominal massage to send the abdominal wall to the diaphragm. In conclusion, Mr. Patey said he felt the

profession was now definitely advancing towards the elucidation of this problem, and that Dr. Howel Evans's work on the blood-platelets was a very pronounced contribution; the actual solution, he felt, would come from the laboratory. Important additions to knowledge on it would, however, arise from old and well-thought-out clinical methods and experiments accurately recorded.

Mr. VICTOR BONNEY first commented on the discordance between clinical facts at the present time and the consequent confusion in which the subject was shrouded. The process might be either bacterial, toxæmic, or hæmic, the latter implying some alteration in the blood itself. In favour of the bacterial idea was the fact that a thrombosis which was obvious, either by the clot being palpable or by visible signs of venous blockage, was always preceded by fever and local pain and other signs of inflammation. On the other hand, cases of pulmonary embolism did not usually exhibit these symptoms before embolism, though there was pain and fever afterwards. Thrombosis, if bacterial, bore no relation to the degree of septicity in the operation area, being, indeed, commoner after so-called "clean" operations than after those in which there was much suppuration. Thrombosis after labour was not usually accompanied by symptoms of typical puerperal fever, but occurred independently in the second or third week, as though it were an entity in itself. The toxic idea Mr. Bonney thought unlikely. Post-operative thrombosis was almost entirely limited to the veins of the lower half of the body, chiefly the legs, and of the legs usually the left one. Toxæmic lesions were generalised, not picking out any region. With regard to the hæmic view, Mr. Bonney pointed out that in hæmophilia lesions were generalised. Thrombosis was rare after operations on the uterus via the vagina, and this seemed to suggest that trauma to the uterus did not suffice to cause thrombosis unless trauma was also caused to the peritoneum. The occurrence of thrombosis after parturition was, however, against this. The symptoms appeared at a significant period—i.e., from the tenth day onwards—whilst in ordinary infection the symptoms appeared in two or three days. Therefore the causal organism in thrombosis did not belong to the group of ordinary septic organisms, the incubation period of which was short. Possibly, he suggested, post-operative thrombosis was due to anaerobic spore infection from the patient's own bowel. Catgut blisters he thought were due to the growth of certain anaerobic sporing organisms in the catgut, and if that were so, they were derived from the animals from which the gut was taken. *Bacillus coli* appeared in the urine after all abdominal sections. Mr. Bonney felt that the research of Dr. Howel Evans was very hopeful.

Discussion.

Mr. J. P. LOCKHART-MUMMERY considered that the problem of post-operative thrombosis was almost entirely a physiological one, and it was not likely to be solved until much more was known about intravascular clotting, a subject as yet only partially understood. This thrombosis admittedly occurred far oftener after abdominal operations than after any others, and he thought it was rightly assumed to be due to interference with movements of the abdominal wall. Even after labour there was a badly stretched abdominal wall which did not afterwards contract properly. It was also agreed that the common time for the occurrence of post-operative infarct was about the tenth day. He believed that the thrombosis in the vein occurred at, or immediately after, the operation, and that the reason of the symptoms at the tenth day was the softening and movement of the clot. Sepsis as a cause need not be seriously discussed. A hundred years ago John Hunter had found that if the jugular vein of a normal horse were tied in two places intravascular clotting did not take place. If at the end of a fortnight that vein were opened which had been tied off, the blood was still fluid, so that mere stasis did not cause clotting. If blood were withdrawn from a vein without the needle having touched its wall in any way save at the point of puncture, the blood so withdrawn could be kept in the laboratory for three weeks without clotting, though in that time it might decompose. If, however, even the slightest trace of thrombokinase were added to the withdrawn blood it immediately clotted. There was no means of preventing thrombokinase getting to the blood when patients were cut, but to some extent stasis in the veins could be prevented. A tight packing of the abdomen after the operation would tend to hold it so steady that the diaphragm would have a better chance of action without causing great pain.

Prof. TOM HARE (who had worked in association with Prof. E. E. Glynn) gave some results of an inquiry into the ætiology of lamb dysentery, which bore some resemblance to melæna neonatorum in human babies. The blood of 11 healthy ewes was examined and the initial counts were made within 5 to 15 days before parturition, the latter process having been, in all, natural and unassisted. One post-partum count was made in each case. He exhibited a table showing that the findings as to the rise in the platelets after parturition agreed with those of Dr. Howel Evans.

Dr. F. J. MCCANN said that much could be done clinically to prevent post-operative thrombosis. In the vast majority of cases he thought the cause of the condition was the surgeon at the operation, either in that he was guilty of errors of technique during the operation or in mistakes made in after-treatment. Efforts should be made to diminish the pain in the abdominal wall. A stitch tied very tightly caused agony until it had cut its way out, and such intense pain had a great influence on the diaphragmatic contraction. If the stitching of the abdominal wall was done without constriction, the surfaces being no more than opposed, little pain after operation would ensue, and Nature's glue would do the rest. Thick material should not be used for sutures. And in the after-treatment a very important matter was movement from the first and allowing patients to lie in any posture they found comfortable. The knee-pillow should be abandoned; it was an important disposer to stasis in the femoral vein. Dr. McCann had not had a case of pulmonary embolism in his 25 years of practice.

Mr. D. LEVI said that in the blood there were thrombin substances which made the blood clot, also heparin which stopped clotting, the latter having been discovered in America. This was very potent, 0·1 g. sufficing to stop coagulation in 40 c.cm. of blood, while 0·1 g. per kg. of animal weight stopped coagulation in an intact animal. It could be sterilised by boiling, and was capable of being injected intravascularly without producing untoward effects.

Mr. CECIL ROWNTREE said all practical surgeons would congratulate Dr. McCann on the success which had attended his surgical endeavours, though the procedures he carried out were used by others whose work was not free from these accidents. It seemed to him there was a danger in this discussion of trying to make the facts fit in with the preconceived hypotheses. The thrombosis under discussion did not always follow operations. He had hoped Mr. Bonney would have given the percentage incidence of the complication after normal labour, when it did sometimes occur. Sometimes a patient died from the accident on the third day. If a patient of his got an obvious femoral thrombosis he, the speaker, felt happy, because he knew that patient would not get a pulmonary embolus. He did not think embolism had any relation to sepsis as ordinarily understood. A friend suggested to him 18 months ago that the administration of large doses of alkali after an operation might so alter the hydrogen-ion concentration as to increase the clotting time, and so avoid thrombosis. It was yet too soon to pronounce on that.

Dr. W. CRAMER pointed out that in the discussion no distinction was made between intravascular

clotting and thrombosis. In both the ultimate result was the same, but intravascular clotting produced by the injection of tissue extracts was a process which took place in a few seconds, whereas thrombosis as clinically seen was a slow process, whose beginning took place, as Mr. Lockhart-Mummery pointed out, at the time of operation. The microscopical structure of a clinical thrombus supported that view. He considered that a thrombus began as a mass of agglutinated platelets with practically no fibrin. Fibrin was formed when the blood-platelets disintegrated, which was different from agglutination.

Miss FRANCES IVENS expressed the hope that Dr. Howel Evans would continue his researches and include in them an investigation of the toxæmias of pregnancy. In her experience thrombosis was much more apt to occur when these toxæmias were present. Possibly substances let loose in the circulation at operation had much to do with the causation of thrombosis.

Dr. HOWEL EVANS, in a brief reply, agreed that post-operative thrombosis was a physiological result. He did not wish to give the impression that he believed that what had been found out concerning the blood-platelets explained the whole matter; but it showed a peculiar physiological response to trauma. A necessary prelude seemed to be tissue destruction and absorption of such products. There might be subtle qualitative changes in the corpuscular constituents or the plasma of which nothing was yet known. Another point was that after splenectomy for splenic anæmia mesenteric thrombosis not infrequently happened. Rosenthal had published a series of cases bearing this out.

Mr. VICTOR BONNEY also replied. He said that formerly he strapped patients rigidly after operation, but most of them would not endure it, consequently he had abandoned the practice. He agreed that it was a means of stopping post-operative distension. In answer to Mr. Rowntree's remark about normal labour, Mr. Bonney agreed that it was another disquieting fact which complicated the study of this accident. He joined with others in assessing highly the value of Dr. Howel Evans's researches, and added that he thought there must be something local which determined the onset of the thrombosis.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT a meeting of this Society held on Jan. 18th, with Dr. J. HOWARD-JONES, the President, in the chair, a discussion on the

INSPECTION AND REGISTRATION OF NURSING HOMES

was opened by Dr. J. J. BUCHAN, who confined his remarks to the administrative and legal aspects of the Nursing Homes Registration Act which came into force on July 1st, 1928. Considerable abuses from the hygienic, medical, and social points of view had been known, he said, to medical officers of health for some time before the Act. Complaints had reached them by circuitous routes and their society had been duly impressed, more so than had the British Medical Association and Ministry of Health. It was, in fact, the representations of the Society of Medical Officers of Health and of the College of Nursing that had led to the passing of the Act. The legislation was a first attempt, but it was so imperfect that it would require almost immediate modification to put it on a sound and practical basis. In the first place a nursing home was defined in very general terms as "any premises used or intended to be used for the reception of and the providing of nursing for persons suffering from any sickness, injury or infirmity." It excluded asylums and institutions under the Lunacy Act of 1890 and the Mental Deficiency Act of 1913, and any place under the control of government or incorporated by Royal Charter, but included all surgical, medical, and maternity homes. The definition, however, went much further than that and brought in convalescent homes, and places for the reception of aged and infirm persons. The Act tried to deal with all these varied institutions as if they were one. Section 1 (3) said that "the local supervising authority shall, on the receipt of an application for registration, register the applicant in respect of the nursing home named in the application and issue to him a certificate of registration." Thus the duty was laid on county councils and county borough councils of registering the home provided it was suitable for the purpose named in the application. There was nothing to prevent a keeper applying for registration as one kind of home, securing a certificate as suitable for that purpose, and then using his premises for another kind of home. The only appeal would be to the court of summary jurisdiction at quarter sessions, and that court would look on the legal position and not on the medical aspect of the case. Dr. Buchan had been advised that it was quite possible within the terms of the Act to use a convalescent home—registered as a "nursing home"—for maternity, and to be a "registered maternity home" without committing a punishable offence. The local authority in such a case would have no authority to cancel the registration. This was a point of real difficulty and one in which the difficulties would increase with time, and it might well do away with the good expected to result from the Maternity Homes Act of 1926. The great objection to the new Act was this way of dealing simply with a very complicated subject. If an old bedridden woman paid a neighbour 15*s*. a week to look after her, the cottage would almost become a "nursing home" under this Act. Any simple procedure such as that set forth in the Act was practically impossible; power should have been given to local authorities to differentiate between the different classes of nursing homes. To demand the presence of registered nurses for aged persons in cottages was an absurdity. The Act was peculiarly unworkable. Dr. Buchan's practice was to ask the medical officer for maternity and child welfare to carry out the inspection under the Act through her health visitors, and to ask the chief sanitary inspector to detail an inspector to look into the sanitary accommodation.

Dr. A. MIDDLETON HEWAT agreed with Dr. Buchan that there were great difficulties in working the Act, and that its wide terms led to differences in interpretation. The first difficulty that arose was presented by the word "nursing" in the definition. It was necessary to prove that nursing was provided in homes for the aged and infirm if these were to be registered, and it was not always easy to know where nursing began and ended. Abuses were often found in these places, and it was as well to include as many as possible under registration. A second difficulty was produced by the definition of a maternity home as "any premises used or intended to be used for the reception of pregnant women or of women immediately after childbirth." In London there were many homes for pregnant unmarried girls who were taken in early in pregnancy and sent elsewhere for their confinements. Under this definition these places became "nursing homes."

Grounds on which Application for Registration may be Refused.

Section 1 (3) enumerated the grounds on which a local authority might refuse to register an applicant: (*a*) "that he is not a fit person whether by reason of age or otherwise." In London it had been ruled that 21 was the minimum age, but no maximum had been fixed, and some homes had been registered where the keeper was getting on in years and it was doubtful whether he or she was fit for the work. Elderly trained nurses, too old for other work, often took in aged and chronic patients, and these institutions needed watching. (*b*) "For reasons connected with situation, construction, accommodation, staffing

or equipiment," the registration might be refused. The existence of an offensive trade next door or of some special fire danger, such as a garage below, would constitute reasons connected with situation. It was the London practice to fix definitely the number and type of cases that might be accommodated in each room, not in the whole building. The space was measured and plans were drawn up by the architect. The certificate stated precisely how many cases might be admitted to each room—e.g., two surgical or medical, or one medical case only. 960 cub. ft. were allowed for mother and baby, 800 cub. ft. for a mother only, 700 cub. ft. for a surgical, medical, senile or chronic case, and 600 cub. ft. for an ante-natal case. In a few cases where the cubic capacity had fallen slightly below the standard, registration had been allowed on a satisfactory square measurement. That it was legally possible to specify the type of case was shown by the same subsection, which went on to say, "fit to be used for a nursing home of such a description as the nursing home named in the application." The classification of cases adopted was: maternity, surgical, medical, and chronic or senile. Of course, many rooms were registered for all or several types of case. There was no objection to nursing surgical cases in a maternity ward, and one bed might be used alternatively for either kind of patient, provided suitable precautions were taken if a septic case occurred. It was, however, the rule that, if a room with more than one bed were used for a maternity case, the other beds should only be used by maternity cases. Women did not like to have their babies in a mixed ward. Mental and alcoholic patients were not allowed in the same home as maternity cases. Many untrained and incompletely trained women were posing as nurses without the knowledge of their patients, and the Act had been initiated to meet this abuse more than any other. Hard-and-fast rules could not be laid down; the number of trained nurses must depend on the number and relative proportion of the cases. In an ordinary nursing home the London County Council required two day and one night nurse for every six patients and one nurse on night duty for every four patients, or for any one patient who was acutely ill. If the keeper were a midwife in practice, she had to make some arrangements for the care of her patients while she was out.

Subsection (3) (*c*, *d*) insisted that the keeper of the home should be a qualified nurse, and to this London had strictly adhered, with the one exception of the small home for senile chronic cases. These were registered if the keeper was a good type of woman and reliable, even though untrained. There was no regulation as to the proportion of qualified to unqualified on the staff, but the inspectors tried to persuade keepers to employ as many qualified nurses as possible. Particular notice was taken of the accommodation provided for the staff, both bedrooms and sitting-rooms. The equipment demanded must depend on the type of home. For the guidance of keepers a leaflet had been printed setting out a standard minimum; the floors must be covered with linoleum or polished; venetian blinds were not allowed; washable covers must be provided for upholstered furniture; each bed must have so many sheets, towels, and blankets; there must be a locked poison cupboard, and a sufficiency of such things as cans, bowls, dressings, and so on. A very important point was fire precautions. No nursing home should be registered without the coöperation of the borough surveyor. Every home in London was inspected by a member of the fire brigade and an architect. Special provision was made in Section 1 (3) (*e*) for new maternity homes; registration was to be refused if "any person employed in attending any woman in the home in childbirth or in nursing any patient in the home is not either a duly qualified medical practitioner, a certified midwife, a pupil midwife, or a qualified nurse." If, now, an old surgical home wanted to register for five maternity beds, it would become a new maternity home under this section. The provisions of the section could not be made to apply to the whole home, so a note was usually put on the certificate that no maternity case should be attended by any but the class of persons listed.

London had adopted practically unchanged the model by-laws suggested by the Ministry, but they had not yet come into operation. They imposed a great deal of clerical work on the keeper of the home. It was most important to carry out the inspection without friction or annoyance and to choose the inspectors very carefully. The London County Council employed only medical officers and sanitary inspectors, as it felt that highly trained matrons might resent inspection from less well-qualified health visitors. Section 6 gave the local authority power to exempt institutions not run for profit. In London it had been considered wiser not to exempt all that came under this proviso, but to inspect them unless their work was already well known, as in the case of the smaller hospitals. Mental cases under single care technically came under this Act, but it had been decided at a conference between the London County Council and the Board of Control that as the patients were adequately visited by the latter body, and as it would be difficult to prove that nursing was provided, these houses should not be registered as nursing homes, provided there were no other nursing activities in them. The Council insisted that an isolation room should be provided wherever two or more maternity patients were housed in one room, and matrons were asked to state what steps they would take if a septic case occurred in a surgical ward or double room. Operating theatres were not required at present.

Dr. Hewat thought it would be quite possible to refuse certification on the grounds allowed in Section 1 (3). In London a provisional registration certificate was issued after the report of the various visitors had been received by the public health committee. Subsequent inspectors reported when the requirements had been complied with, and the final certificate was then supplied. Already there had been very considerable improvement, especially in cleanliness and general orderliness.

The Matron's Point of View.

Miss M. M. WINSTANLEY emphasised the fact that nurses had wanted the Act, and that their ideals were as high as could be desired; it was from no personal hardship that she offered certain criticisms of the requirements of the London County Council. For instance, they had thought it necessary to insist on outside staircases, balconies connecting with the next house, a certain number of exits; that area doors always be kept open, windows never be barred, and panels be lined with asbestos. Balconies connecting with the next house might cause considerable unpleasantness with neighbours, and area doors opening on to mews might cause grave nuisance. Matrons found it hard to believe that houses which they had been running for 30 or 40 years had suddenly become unsafe. They would not wish to put forward any argument against the safety of their patients, but they wished to ensure at the same time the safety of the patient and the safety of those women who had struggled for years and who depended on the homes for their livelihood. There was small danger of fire in nursing homes, owing to the constant supervision. No part of a nursing home was ever left unattended for long, night or day, and patients were safer there than in their own homes. Moreover, West End nursing homes were surrounded by fire stations and the record of fires in them was almost nil. On an average two-thirds of the patients in a home at any time would be well enough to walk out, and if sufficient extinguishers were provided the fire would soon be got under control. Nowadays there were very efficient fire escapes suitable even for abdominal cases. It was difficult to see how doors were going to be a protection; they made increased work and noise and liability to accidents, and it was more difficult to move patients and to detect fire by

smell. Nor could the nurse hear at once if patients got out of bed. Unbarred windows and open doors would be a danger to patients with high temperatures, who were apt to wander about. Demands for extensive structural alterations came very hard on people with short leases; fortunes were not made out of nursing homes nowadays, and nearly all the profits went into improvements. Matrons had felt that it would be helpful if someone with experience of running a nursing home could be consulted about equipment, staff, rooms, and such matters. Some medical cases, like pneumonia and typhoid, required larger rooms than surgical ones. Nursing could be magnificent without modern appliances, and the details of the running of a home must radiate from the personality of the head and her staff.

Discussion.

Dr. GERARD TAYLOR asked what was a reasonable standard of space to demand for a children's convalescent home. Standards ranging from 45 to 77 sq. ft. had been put forward by different authorities. In Berkshire they had made it a general rule not to grant exemption to any convalescent homes; this avoided invidiousness, and was working well.

Dr. R. M. F. PICKEN said that most of the trouble was going to arise out of the by-laws. Cardiff had adopted the model supplied by the Ministry, and difficulties had been raised by consulting surgeons. The local division of the British Medical Association had asked the Headquarters Staff of the B.M.A. to see the Ministry of Health with a view to altering these regulations. They objected, for instance, to compelling the keeper to enter every payment made by or on behalf of patients, on the grounds that it was no business of the local authority if the nursing home made a private arrangement with the doctor to take a poorer patient for a reduced fee. One surgeon had objected to the matron keeping medical records and had forbidden her to keep any of his cases, on the ground that he kept them himself. In this case the surgeon was the culprit, but the matron would be the person to be punished, and she was placed in a very difficult position. Objection was also made to requiring the keeper to record payments to any medical practitioner, although this was really intended to prevent the abuses of "farming out" and arranging to dispose of unwanted children. Cardiff had taken the line that only medical officers should visit any nursing home, except that the senior health visitor had been approved to inspect some of the small maternity homes.

Dr. STELLA CHURCHILL said that the Act had revealed an appalling state of affairs, and the future was going to be worse unless there was some alternative to the private nursing home. The necessary alterations could not be put into practice by many of the homes, and they would cease to exist. Paying wards in hospitals were over-full, and large paying hospitals were needed. The Bill had raised the standard and would also increase the shortage of nursing homes.

A vote of thanks to the speakers was proposed by Dr. CHARLES PORTER, and seconded by the PRESIDENT, who remarked that the Act, although very incomplete, had already been abundantly justified.

Dr. BUCHAN, in reply, said he was very glad that the London County Council was acting as it was, but he thought the time would come when it would realise that its interpretation was not justified by the Act. Nursing homes were not profitable concerns, and sympathy with their owners should be shown in drawing up requirements.

Dr. HEWAT, in reply, said he had found the entry of payments very useful in disputes between keepers and patients about fees. The by-laws had been approved by B.M.A. headquarters before being sent out. The cheap nursing home was going to suffer, but those that went would not be missed, as it was impossible to provide proper nursing attention at three guineas a week. The Act would not close down the decent home.

Reviews and Notices of Books.

THE BRAIN FROM APE TO MAN.

By FREDERICK TILNEY, Ph.D., M.D., Professor of Neurology, Columbia University. With Chapters on the Reconstruction of the Grey Matter in the Primate Brainstem by HENRY ALSOP RILEY, A.M., M.D., Associate Professor of Neurology in the University. In two volumes, with 557 illustrations, many in colour. London: H. K. Lewis and Co., Ltd. 1928. Pp. 1120. 5 guineas.

IN two superbly printed and illustrated volumes Prof. Tilney has made a contribution to the study of the evolutionary aspects of the central nervous system on a scale never previously attempted. The book is largely devoted to the technical side of comparative anatomy, as far as the brain is concerned; it is based on the view that minute comparison of the morphology of that organ in different representatives of the higher mammals is calculated to illuminate differences in behaviour among them as well as between them and man. At the same time a study of this kind will accentuate and explain the relative resemblances among the primates. Some 15 years of the author's life have been occupied with the anatomical preparation of material from no less than 11 of the higher mammals, beginning with the lemur and inclusive of gibbon, orang, chimpanzee, gorilla, and man. In each the whole brain has been examined macroscopically and microscopically; its measurements have been taken and its salient features recorded; the research has ranged from the fissural pattern of the cortex to the minute anatomy of the brain-stem. The accounts are fully illustrated with photographs of microscopical sections as well as with ingenious coloured reproductions of the relative size and position of the various ganglionic collections of grey matter in the pons, mid-brain, and medulla. Preceding each description is a succinct narration of the habits of the animal concerned; at the end of the sections are summaries with interpretations and discussions of the behaviouristic and anatomical data in their bearing on the evolution of the primates.

In the midst of this almost overwhelming anatomical profusion the distinguished author has not lost sight of his goal, which is to show that analogies outstrip differences, and that graded advances up the scale to man correspond to definite changes in structure which illustrate in unmistakable fashion the reality of the evolutionary process. The first volume, as a fact, really paves the way to the still more fascinating second volume, in which are chapters dealing with primitive and prehistoric man, with his cranial relics, and with the reconstruction therefrom of his types of brain. It is worth noting that Prof. Tilney sees in the progressive development of the functions of the hand that stimulus to increasing intricacy and complexity of structure which characterises the successive changes in the morphology of the brain; and it is curious to think that in this respect he has followed, one century later, the speculations of Sir Charles Bell. He does not hold with those who assert that man has descended (or, better, ascended) from an anthropoid stock; rather does the evidence point to the existence of a common pre-human stock, at some infinitely distant period, from which both anthropoid apes and man have, separately, come. Five distinctions between the two constitute fundamental divergencies—viz., the human brain, the human foot, the human hand, the erect posture with bipedal locomotion, and a terrestrial mode of life. A natural corollary of such studies is the question whether evolution is at an end; to this a negative if speculative answer is given. Man has within himself a "structural plasticity for further development" which has been sacrified in the case of the apes. The more organised the encephalic patterns the less are they capable of modification; variations

are the very basis of advance. Prof. Tilney allows himself the pleasure of meditating on the future of man, which he thinks lies with the frontal lobes.

THE MATRIX OF THE MIND.

By FREDERIC WOOD JONES, Professor of Physical Anthropology, University of Hawaii; and STANLEY D. PORTEUS, Professor of Clinical Psychology in the University. Honolulu: University Press Association.[1] 1928. Pp. 457.

THIS book adds still another to the increasing number of volumes of recent years which incorporate more or less successful (or unsuccessful) attempts to blend the subject matter of the sister sciences—neurology and psychology. The appearance of these is doubtless a favourable portent, as the authors remark, even if psychological purists still write as though the mind were no more closely connected with the brain than with the larynx; and even if the central nervous system is studied by many neurologists in almost total disregard of its higher functions. Of course, certain prolegomena are requisite if the two aspects of function are to be usefully correlated; working hypotheses must bridge gaps, and assumptions are essential to take the place of what is not proven and may never be. The actual handling of the material in the book, though we are in sympathy with the general viewpoint of its writers, is puzzling. The first part provides a compendium of physiological anatomy, human and comparative, which is interesting in itself and embodies not a few relatively little known data; but the information is sometimes rather obscured by an expansive style and an unusual resort to rather elementary illustrations which make us wonder for what class of readers the work is really intended. This impression is not lessened by the titles of some of the sections: "The triumph of the pallium," "Mistakes in brain building," "What the cortex cannot do," doubtless represent the truth, but they do not appeal to the tutored mind. It is curious that these methods should be used, for the physiology of the first part is not only thoroughly modernistic, but is excellently expounded with an eye to its bearings on, and relations to, psychology. The second part is similarly unconventional, though it is none the worse for that; we read of "Built-in habits," "Neural crossroads," "Sense of aliveness" with relish, mildly tempered by an undercurrent of methodological criticism. Yet here again the facts are well set forth and their trend indicated with conspicuous fairness.

A number of useful illustrations and diagrams are supplied, but there are no bibliographical references.

ŒUVRES DE PASTEUR.

Edited by P. VALLERY-RADOT. Vol. V., *Études sur la bière.* Paris: Masson and Co. 1928. Pp. 361. With 12 plates and 85 text-figures. Fr.120.

PASTEUR did not care much about beer himself but his patriotic spirit was so moved by the events of 1870 that he set to work enthusiastically to find out how the French brewers might make something as good as the German product which was at the time incontestably superior and had a European reputation. Applying the principles which he had already established, he showed that all that was needed was cleanliness and protection from contamination with undesirable microbes. His studies culminated in his "Études sur la bière" published in 1876 (an English translation in 1879), and the greater part of this volume of his collected works is occupied with a reprint of this classic. It is, of course, of much more than technical interest and contains many of Pasteur's proofs that micro-organisms are real things, arising from similar organisms and having specific fermentative reactions. Pasteur visited English breweries in 1871 and there is included some correspondence with Tyndall and Lister.

DENTAL ANATOMY.

Notes on Dental Anatomy and Physiology and Dental Histology. Fifth edition. By T. W. WIDDOWSON, L.D.S., Lecturer on Dental Anatomy and Physiology at King's College, London. London: John Bale, Sons, and Danielsson. 1928. Pp. 588. 25*s*.

THIS book was designed as a note-book for students preparing for examinations, to be read with larger and more formal text-books. In successive editions the size of the volume grew, but its character was retained. But in this fifth edition the scope of the book has been changed, and it has been transformed into a text-book of dental anatomy, which competes with such well-known works as those by Tomes and Mummery. It is a pity that the author has still retained a misleading title which does not now do justice to the contents of his book. While it does not contain the wealth of detail on comparative dental anatomy which has made Tomes's book so valuable to the serious student of zoology, or the original work on dental histology which distinguishes Mummery's treatise, it provides an extremely well-written and clear account of a subject which the average dental student usually dreads. The author has shown much skill in selecting the relevant points from the material at his disposal, and in giving the student the information essential for examination purposes. The opening chapters on cytology and embryology form a useful introduction, which is followed by an excellent account of the development of the jaws in which the work of J. C. Brash and E. Fawcett is fully described. The difficult subject of the evolution of tooth forms is successfully described, especially the complicated theory put forward by L. Bolk. The chief value of the book lies in the skilful way in which controversial points which might confuse the dental student are dealt with. The author deserves congratulation on an admirable production.

NARCOTIC POISONS AND ADDICTION.

Rauschgifte und Suchten. By Dr. FRITZ REDLICH. Bonn: Kurt Schroeder. 1929. Pp. 98. M.4.40.

IN a booklet of 98 pages, with numerous statistical tables and copious bibliographical references, Dr. Redlich reviews the world production and consumption of cocaine, opium, morphine, and heroin, literally and specifically from China to Peru. Figures are cited to show that, alike in the old world and in the new, cocaine has since the war become a more potent factor than formerly in the production of mental disorder, as well as in its illicit employment for vicious and criminal purposes.

The story of opium cultivation in China is told: its almost complete cessation in the years following the arrest of export to China of Indian opium from 1907 onwards, and the recrudescence of opium-growing during the civil wars. The method of Government monopoly of opium production and distribution in India is described; the continued export of Indian opium to eastern countries, other than China, and the large consumption of opium in certain townships in India and Burma are commented upon. The manufacture of morphine is, according to the available statistics, enormously in excess of any conceivable requirement for medicinal purposes. The amount of the drug, either licitly or illicitly imported into China—if the figures vouchsafed can be relied on—is appalling; from 1917 to 1920 20 to 30 tons are recorded as having been annually imported or smuggled into that country. The best that can be said for the morphinomaniac, according to Dr. Redlich, is that his criminality is more passive and less dangerous

[1] Messrs. Edward Arnold and Company inform us that they have taken over the British Empire and Continental rights of this book and that orders for it should be sent to them. A revised edition (probable price 21*s*.) is in the press and will be ready before Easter.

than is that of the victim of cocainism. As regards heroin, prior to the Great War Germany had practically a monopoly of the manufacture of this alkaloid, but since the war Great Britain, Japan, Switzerland, and the United States have engaged in its production, but in the last-named the manufacture and importation of heroin has, since 1924, been forbidden by law. At the second Geneva Opium Conference such restriction, though advocated by the American delegation, was opposed by the French, German, and English representatives, who considered heroin to be an indispensable drug. Dr. Redlich regards 1½ tons of heroin annually as adequate for the world's supply for medicinal purposes. He confirms the view that heroin is the most pernicious and insidious of all narcotic drugs in its mental and moral effects.

In his final chapter Dr. Redlich discusses the problem of combating narcomania in its various manifestations. He agrees that the plan urged by the American delegates at Geneva, and adumbrated by the British delegates at The Hague Conferences—viz., limitation of production at the source of the raw materials and manufacture of drugs of addiction—would be successful, if only it were practicable. The alternative method advocated by Germany and supported by some other States, of an international syndicalisation of the drug traffic, is not free from objections. Questions would arise as to which countries should be the producers, and also as to the price to be charged, medical needs requiring a low one and the monopoly a high one. The author believes advance must be gradual, and by way of strict control of the manufacture and of the channels of distribution of dangerous drugs, and that this requires international coöperation of the police and heavy punishments for offenders in the matter of illicit traffic or consumption.

TRIAL OF EUGENE MARIE CHANTRELLE.

Edited by A. DUNCAN SMITH. Edinburgh and London: W. Hodge and Co, 1928. Pp. 243. 10*s*. 6*d*.

Chantrelle, a Frenchman teaching languages in Edinburgh, made a hasty marriage with one of his school-girl pupils who was only 16 when the first of their four children was born. She was a good wife, he a violent, cruel, and unfaithful husband. Finding his financial position difficult, his professional work falling off, and his debts increasing, he insured her life (in spite of her objections and to her manifest alarm) for £1000 against death by accident. On New Year's Day, 1878, she was alive and well; next morning the servant found her unconscious in bed. Chantrelle sought to suggest that she was poisoned by coal gas; he apparently tampered with a gas-pipe himself after his wife lost consciousness. Dr. James Carmichael was summoned; he sent for Dr. H. D. Littlejohn, the city medical officer, telling him there was a case of gas poisoning for him to see. Mrs. Chantrelle was removed to the Royal Infirmary where she died without recovering consciousness. At the infirmary Prof. Maclagan was strongly of opinion that the poisoning was not from gas, but from some narcotic. Post-mortem examination confirmed the view that gas had not caused death, but failed to prove the presence of a narcotic; subsequent chemical analysis of parts of the body gave no positive result. On Mrs. Chantrelle's night-dress and bedding there were stains of vomit in one of which opium was detected. The evidence against Chantrelle was circumstantial. He had dabbled a good deal in drugs and had a cupboard full of bottles, some of which contained opium. He had threatened to take his wife's life; he had the means and the opportunity; he had no affection for her; he had a strong financial motive for murder; his behaviour over the gas escape was highly suspicious. The jury having found him guilty, he made an injudicious outburst in which he seemed to throw over the gas poisoning theory and to accept the evidence of opium, thus weakening his previous defence.

Medico-legal readers of the trial will form their own opinion whether modern scientific evidence would not have been more conclusive. The medical witnesses 50 years ago had seen few cases of coal gas poisoning. Mr. A. Duncan Smith has edited the trial with such thoroughness as to include a full description of Chantrelle's last hours and execution. In his editing he was appropriately assisted by Emeritus Professor Sir Henry D. Littlejohn. The present Lord Shaw, it is interesting to note, was one of Chantrelle's counsel. The book first appeared in 1906 in the Notable Scottish Trial Series. Uninstructed English readers might have been glad of some brief note on Scots law phraseology and the distinctive features of Scottish procedure such as the absence of a coroner's inquest and the omission of an opening speech for the Crown.

PROTOZOA.

Lehrbuch der Protozoenkunde. Founded by FRANZ DOFLEIN. Fifth edition. Revised by Prof. Dr. EDUARD REICHENOW, Departmental Director at the Institute for Marine and Tropical Diseases, Hamburg. Part II., *Spezielle Naturgeschichte der Protozoen*. First half: *Mastigophoren und Rhizopoden*. Jena: Gustav Fischer. 1928. With 435 text-figures. Pp. 326. M.22.

PART I. of the fifth edition of this well-known treatise on protozoology was reviewed in THE LANCET, 1928, i., 914. It dealt with general principles without any special reference to parasitic forms, though these received ample consideration. The first half of Part II. begins with the classification of the protozoa and discusses in detail the mastigophora and rhizopoda, concluding with a classification of the sporozoa which, with other groups not dealt with in this section, will form the subject matter of the second half of Part II.

Prof. Reichenow has adhered to the arrangement of the original author, Franz Doflein, but much new matter has been introduced, particularly in connexion with parasitic forms which produce disease in man and animals. In this respect the present edition is a distinct improvement on the earlier ones, in which the human parasitic protozoa received inadequate attention. Now, however, the protozoologist will find in it a clear and accurate account of these important organisms, and the work has thus become as useful to the medical man and veterinarian as to the zoologist. The protozoa are subdivided into Doflein's two main groups, the plasmodroma and ciliophora. The former, with which the first half of Part II. is mainly concerned, is subdivided into the classes mastigophora, rhizopoda, and sporozoa, the mastigophora preceding the rhizopoda as representing the more primitive forms. The subject matter is handled in the careful manner which we expect from the authors. When the work is completed the library of protozoologists will be enriched by a comprehensive treatise, beautifully and profusely illustrated.

FROM THE MONOTREMES TO THE MADONNA.

By FABIUS ZACHARY SNOOP. London: John Bale, Sons, and Danielsson, Ltd. 1928. Pp. 143. 3*s*.

THIS little book claims to be a study of the breast in culture and religion. In spite of its alliterative title and certain tricks of style which may irritate some readers, the book is obviously the work of an extremely well-read person. It seeks to prove that the ideas which surround the breast in folk-lore, literature, and art lead to fundamental characteristics of religious belief and human behaviour. Perhaps the most interesting chapters are those on Aaron's Breastplate and the significance of jewellery worn on the breast, on Mountains of Myrrh, dealing with the art of and reasons for perfumery, and the Bloody Teat, on injuries of the breast inflicted in the interests of culture. Some of the author's ideas and opinions, though interesting, will not meet with general acceptance.

JOURNALS.

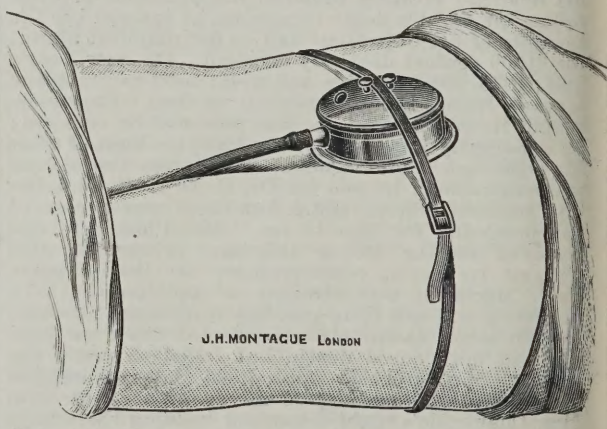
JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXXII., pp. 1–172, January, 1929. — Focal Necrosis of the Liver, by J. W. Edington (Sheffield). The characteristic change found in guinea-pigs infected with *Bacillus aertrycke* may be reproduced by tying the common bile-duct and injecting various organisms or toxins subcutaneously. The lesions are localised by biliary stasis.—Chronic Peptic Ulcer of the Œsophagus, by M. J. Stewart and S. J. Hartfall (Leeds). Epigastric pain and recurrent hæmatemesis; death from perforation into right pleura.—"Smooth-rough" Variation in Bacteria in its Relation to Bacteriophage, by F. M. Burnet (London).—Retro-peritoneal Ganglionic Neuroma, by D. F. Cappell (Glasgow). A very large tumour composed of adult ganglion cells and nerve-fibres and correspondingly benign.—Three Notes on Tuberculin, by H. J. Parish and C. C. Okell (London). Tuberculins are very stable and heat-resistant. Skin sensitiveness develops in guinea-pigs in a week after infection.—The Relationship between the Hæmolytic Complement and the Opsonic Power of Normal Guinea-pig Serum, by J. Gordon, H. R. Whitehead, and A. Wormall (Leeds). Destruction of hæmolytic complement by ammonia does not greatly reduce the opsonic power of the serum.—The Nervous System in Rats Fed on Diets Deficient in Vitamins B 1 and B 2, by R. O. Stern and G. M. Findlay (London). Absence of both factors or of the antineuritic factor does not cause any specific lesions in the nervous system despite the occurrence of paralytic symptoms. Absence of B 2 produced symptoms and skin lesions like pellagra with vacuolation and pigmentation of motor cells in the cord.—A Case of Diabetes Mellitus with Acromegaly and Lipæmia, by J. Gray (Aberdeen). Death from diabetic coma: cirrhosis of pancreas, chromophobe adenoma of pituitary.—The Isolation of *Bacterium morgani* from the Mammals, Birds, and Reptiles at the Zoological Gardens, by R. Lovell (London). Morgan's bacillus seemed to be the cause of death in four monkeys, one bird, and four reptiles.—Notes on Intestinal Bacilli, with Special Reference to Smooth and Rough Races, by P. B. White (London). Rough races probably afford the better basis for a rational classification.—Diffuse and Nodular Fibrosis of Adventitia of Aorta, by W. G. Barnard (London). A remarkable overgrowth of the adventitia up to 10 mm. thick of dense fibrous tissue, probably rheumatic.—Generalised Vaccinia in Rabbits with Especial Reference to Lesions in the Internal Organs, by S. R. Douglas, W. Smith, and L. R. W. Price (London). A condition resembling alastrim may be produced in rabbits in which almost all the organs except the kidneys show lesions. Virus may remain latent in the tissues for as long as six weeks after infection.—Standardisation of Antidysentery Serum: Effect of Increased Test Dose on the Accuracy of the Titration, by A. V. Blake and C. C. Okell (London). A considerable increase in precision is obtained by using five times the usual test dose of bacillary bodies.—A Statistical Note on the Testing of Antidysentery Sera, by J. W. Trevan (London). Statistical discussion of the preceding paper generally applicable to such experiments.—Siderosis of the *Globus pallidus*: Its Relation to Bilateral Necrosis, by G. Hadfield (London). The blood-vessels of the *Globus pallidus* are often degenerate and encrusted with iron salts (formerly described as "calcification"); this explains the bilateral necrosis often found in CO poisoning which is not immediately fatal.—Experiments on the Nature of the Carcinogenic Agents in Mineral Oils, by C. C. Twort and J. D. Fulton (Manchester). The active agents are concentrated in extracts made with methyl sulphite, methyl sulphate, or picric acid, and rendered inactive by treatment with sulphuric acid or silica gel, and by oxidation or reduction.—Neuroglial Tumour of Spinal Cord, by W. G. Barnard (London).—A Simple Method of Preparing Accurate Pen and Ink Drawings of Specimens, by T. Shennan (Aberdeen). An ordinary photo print is inked in as desired with India ink and bleached with iodine and "hypo."—Generalised Osteosclerosis, by F. Parkes Weber (London). A typical example of marble bones with severe anæmia.—Demonstration of the Peculiar Bodies of Pulmonary Asbestosis in Material Obtained by Lung Puncture and in Sputum, by M. J. Stewart and A. C. Haddow (Leeds).

THE Published Papers by Members of the Staff of the Middlesex Hospital Medical School for the year 1927–28 have been issued in the usual form of a collection of reprints of various shapes and sizes bound in one volume. Most of the papers have already been published in widely circulated journals and need no further reference. An address delivered at the Lake Mohonk Conference on Cancer Control in May, 1927, by Mr. Sampson Handley, here reprinted, gives an interesting account of the development of cancer education in this country. Dental research is represented by an important paper by Mr. Warwick James and Dr. A. Counsell on the primary lesion in so-called pyorrhœa alveolaris, and by a paper by Dr. Lazarus Barlow on the bacteriology of the alveolar bone in relation to pyorrhœa. The physiological department is responsible for many interesting papers, especially one on the ethyl iodide method for the estimation of the circulation rate in man by Dr. Samson Wright and Mr. M. Kremer. An outstanding contribution from the pathological side is the article by Mr. D. H. Patey and Dr. R. W. Scarff on the position of histology in the prognosis of carcinoma of the breast, reprinted from our own columns. A lecture on the ovarian hormone by Prof. E. C. Dodds sums up a large amount of work by himself and his colleagues in the Courtauld Institute of Biochemistry.

New Inventions.

AN IMPROVED BOX FOR USE AFTER SUPRAPUBIC CYSTOTOMY.

THE box shown in the illustration is an improvement on the old Hamilton Irving box which is wrong mechanically. The latter consists of an oval box which has to adjust itself to a convex or concave surface; to this end it is held by four straps, which can never maintain an equal tension; with each movement the



patient tightens one at the expense of the rest, and this results in displacement of the box and causes leakage. The new box consists of a section of a sphere fixed at its top central point (by a single band of half-inch elastic), so that pressure is distributed equally to every part of the rim. Thus, with every movement of the patient the sphere of the rim adjusts itself mechanically to the convex (or concave) surface of the abdomen.

The boxes are made for me by J. H. Montague, 69, New Bond-street, London, W.

SYDNEY G. MACDONALD, M.B., B. Chir. Camb., F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, JANUARY 26, 1929.

THE KING'S HEALTH.

THE announcement on Tuesday last by HIS MAJESTY'S doctors that the time was approaching when the patient might be removed safely to the South Coast has been regarded widely as a landmark in the long story of the illness. Although the public has been expressly warned that the period of convalescence cannot yet be regarded as having set in, it is highly reassuring to note that the KING'S medical advisers can contemplate for him a somewhat lengthy journey by road or rail in the immediate future. The place of residence has been chosen for its close proximity to the sea, its southern exposure, and its protection from wind, while the location is associated with a measure of privacy and provides reasonable access to London. Bognor is regarded as one of the sunniest of the South Coast health resorts. Its rainfall averages under 26 inches in the year, and there is but little fog or frost, while in the commencing Spring the north-easterly winds are kept off the seaboard by the nearness of the South Downs. The mean temperature of the winter months is about 42° F., and there is an average of 2·8 hours of sunshine a day, being about 30 per cent. of the possible hours during which the sun is above the horizon. Craigweil House, which has been lent for the reception of the KING by Sir Arthur Du Cros, has been extensively altered since it was used by the late Dr. A. H. Stocker as a convalescent station for his London patients, and the large grounds, gently falling to the strand, afford ample scope for exercise and for the assistance to convalescence under conditions of perfect privacy. Craigweil House not only enjoys a full South exposure, but has been equipped with rooms specially designed for sun treatment. The stimulating quality of the sea air is likely to be helpful, both in its generally invigorating qualities and in its special aid to the restitution of damaged tissues. The empyema wound is now stated to be small and steadily healing, and the relative unimportance of this complication may be gauged by the fact that twice during the past week Sir Hugh Rigby has not been asked to sign the official bulletin. Under such conditions we may reasonably hope that convalescence may soon be reached. Especially encouraging is the announcement that solid food is now being enjoyed, for it is an open secret that for a long time it required HER MAJESTY'S constant assistance to ensure that nourishment of any kind was taken.

Once again we may congratulate the KING'S medical advisers on the fruition of their devoted labours, and on having found in the Royal household so ready an acceptance of the measures which they considered desirable to employ. It is generally believed that nowhere can better treatment be found than in one of the large general teaching hospitals of London, but HIS MAJESTY'S wonderful recovery may lead to a justifiable suspicion that in one household these conditions have been bettered. The KING'S health will still take the central place in the interest of his subjects, though all the indications are that the story will now be uneventful even if prolonged.

TONSILLECTOMY FOR ARTHRITIS.

THE part played by the infected tonsil in the production of chronic disturbance in distant-lying organs is being closely studied in this country and in America. In setting out recently [1] some of the evidence for this belief, it was remarked that the culpability of the tonsil is not easy to establish in the group of conditions generally called rheumatic. A. D. KAISER, of Rochester, N.Y., in examining the records of 48,000 school children, found [2] that the incidence of rheumatic fever and joint pains was slightly less in the 20,000 whose tonsils had been removed than in the remainder in whom they had not been removed, and some earlier work at the Mayo Clinic aimed at assessing the effect of tonsillectomy performed after subacute joint trouble had already set in. This week, in our own columns, Mr. A. B. PAVEY-SMITH, of Harrogate, records an analysis of the results of tonsillectomy performed at the Royal Bath Hospital there. Of the 7000 cases of arthritis and allied diseases treated at this hospital in the six years under review, some 400 were sent to Mr. PAVEY-SMITH on account of conditions falling under the three headings of subacute rheumatism, chronic infective (focal) arthritis, and fibrositis. From these he chose about 200 of ages ranging from 10 to 64 as suitable for tonsillectomy, which was accordingly performed. His observations on them lead him to think that a probable tonsil focus can be found in a large number of cases falling into these three groups, and he says that when the tonsil is removed the results are so good in one group—namely, subacute rheumatism—that tonsillectomy should become a routine part of its treatment if only as a prophylactic against recurrence and cardiac complication. He claims that even when septic tonsils have caused chronic inflammation in joints improvement from their excision may be expected in 80 per cent. of cases, provided that the tonsil actually shows one or other of the stigmata of infection. He admits, however, that systemic infection can never be deduced from the appearance of the tonsil itself; it can only be inferred. We regard Mr. PAVEY-SMITH'S observations as worthy of record and his figures as distinctly favouring the conclusions which he draws. His cases had the merit of being taken serially, although they lack comparison with a control group of similar cases treated without operation and watched for a similar length of time. It may be that no such valid control is obtainable, but it would be of interest to follow up the 200 other patients who were referred to him on account of focal sepsis and in whom he failed to find enough evidence to justify tonsillectomy. The class of case included in the series is so common and so distressing in its disability and chronicity that the success of so simple a remedy would be very heartening to the practitioner who may be overwhelmed by the number of such cases and his comparative helplessness in the face of them. Apart from the clinical evidence in his paper, Mr. PAVEY-SMITH adduces evidence which increases the suspicion under which the *Streptococcus viridans* already lies as the primary infective agent in chronic focal arthritis. The occurrence of the organism is, in fact, so frequent as to imply that it must either be an active agent or count for nothing at all. In this matter any effective control might be still more difficult to devise.

[1] THE LANCET, 1928, ii., 1248.
[2] Jour. Amer. Med. Assoc., 1927, lxxxix., 2239.

YELLOW FEVER.

TWENTY-EIGHT years ago WALTER REED'S Cuban Commission proved that yellow fever is spread by mosquitoes, and after a campaign of 90 days the city of Havana was freed from infection for the first time in 200 years. It then seemed that the disease had ceased to be a major menace to life in the American and African tropics; it seemed that the victory of scientific method was complete and that scientific tactics would shortly clear the danger zones of all their smouldering infection. But while these hopes have been largely realised in America we are faced in West Africa with a situation that grows more threatening with every new facility for rapid transport. Yellow fever still lingers in the colonies and protectorates up and down that coast, and its presence has become important to sanitarians of other countries because it is now within the bounds of possibility that the virus may be disseminated among mosquitoes in distant parts of the world. Not only is the ordinary vector—*Aëdes aegypti* (*Stegomyia fasciata*)—found throughout the tropics and sub-tropics, but it has been shown that other mosquitoes even of a different genus are capable of carrying the disease. The shortness of the time of incubation is no longer a certain obstacle to the passage of infected persons across the African continent, and it is feared that yellow fever may travel by relays into the Orient just as once it may have travelled to America by way of slave ships. So, in Sir WALTER FLETCHER'S words, "It is no stretch of fancy to say that the discovery of the true nature of the disease and of its preventability by vaccination may have come just in time to save us from a world disaster of unthinkable magnitude." Yellow fever investigators, as he says, are playing for high stakes, and this is the justification for the hazard of so many valuable lives.

Those who know the story of WALTER REED'S researches will recall that the members of his Commission risked not only their own lives but also those of many volunteers whose names and deeds have mostly been forgotten. Deaths from yellow fever among the American troops in the Spanish War had far outnumbered the fatal battle casualties, and REED was clearly right in deciding that it was worth while to make further sacrifices if thus and thus alone it could be discovered how to prevent the disease. But once the main problem of transmission had been solved and the emergencies of war were over, it was impossible for his successors in research to experiment with human beings where so deadly an infection was concerned. The odds were thus against them, for almost all attempts failed to transmit the virus to monkeys, dogs, rabbits, guinea-pigs, or other animals, and all these possible hosts were found unsatisfactory for practical purposes. As is well known, NOGUCHI reproduced in guinea-pigs a condition which he regarded as identical with yellow fever and which he said was due to the *Leptospira icteroides*. For many years, indeed, this held the field as the causal organism of yellow fever, and was used extensively in the manufacture of vaccines; but we now know that it in no way differs from the *Leptospira ictero-hæmorrhagiæ* of Weil's disease and must attribute the confusion to erroneous clinical diagnosis or to coexistence of the two infections in certain cases. Controversy over the significance of the leptospira gave rise to suggestions that African and American yellow fever were not the same disease, and these and other doubts and difficulties could not readily be solved as there was no animal on which to make the necessary tests. Hence we may say that the renaissance of yellow fever research dates from 1927 when ADRIAN STOKES, J. H. BAUER, and N. P. HUDSON discovered that Asiatic monkeys, notably the *Macacus rhesus*, are susceptible to the virus. Previous experiments with African monkeys had always failed, but it has now been ascertained that several species of macacus, including *cynomolgus*, can be used for laboratory studies. The work undertaken by STOKES and other members of the Rockefeller Commission at Lagos at once confirmed the statements of REED'S and MARCHOUX'S commissions by proving that yellow fever virus will pass through V and N grades of Berkefeld filters. Infected organs were found to retain their virulence for at least 18 days if kept frozen—HINDLE claims, indeed, that liver or blood dried in vacuo will remain virulent indefinitely—and these discoveries have made it possible to start research on yellow fever in northern countries where natural infection is unknown and where the conditions of experiment are therefore easier. In March of last year Dr. A. W. SELLARDS, of Harvard University, brought to London the liver of a monkey infected from a patient at Dakar, and this strain has been the basis not only of HINDLE'S investigations but also those of A. PETTIT and others in Paris.

The latest news of Prof. EDWARD HINDLE'S studies is summarised on page 183, and our readers will see at once how fruitful they have been. Profiting by the knowledge of filterable viruses which has accumulated recently in this country from the study of dog distemper and fowl plague, he was able, on receiving yellow fever virus, to prepare a vaccine which is extremely potent in protecting monkeys against the disease. Last June he showed that phenolised glycerine emulsion of the liver and spleen of infected monkeys confers immunity against 10,000 to 100,000 lethal doses of the virus, and the preparation by which he has now superseded it is equally effective in protecting animals. Its value to human beings is, of course, less easy to assess, but there is every reason to suppose it considerable. A vaccine made according to a slight modification of HINDLE'S recipe has been tried at Rio de Janeiro by H. DE B. ARAGÃO, who has used it without ill-effects in 300 or 400 cases and has arranged for its preparation on a large scale by the Brazilian Public Health Department. Our own Colonial Office has also decided to give HINDLE'S vaccine a trial, and its employment in the West African colonies will be watched with deep interest.

Prof. HINDLE'S own experiences bear witness once again to the risk of working with yellow fever in the laboratory, and it now seems certain that the virus may enter the body not only by the bite of insects but also through mucous membranes and possibly even through intact skin. The fact that the serum of convalescents confers a transient immunity has been used by members of the Rockefeller Commission and others to protect those in close contact with the disease, and attempts are being made in PETTIT'S laboratory and elsewhere to prepare a serum strong enough to modify the course of the illness once it has begun. No such powerful remedy has yet been made, and for the present our hopes lie wholly in preventive measures. These must partly depend, however, upon the early recognition of incipient epidemics, and here the susceptibility of rhesus monkeys is of incalculable value. The blood of a

atient as a rule contains the virus during the first ree days of his illness, and its injection into onkeys should reveal the true nature of the fever, hilst the serum of a convalescent will confer an mmunity which is equally characteristic. This use monkeys will have to continue until some sero- gical reaction has been devised to take its place, and ese animals will have to be supplied without stint nce diagnosis followed by efficient vaccination is ir best means of combating the disease in places hich cannot at present be rid of the mosquito. is now understood that native populations have a gh resistance to infection, and that yellow fever curs among them in all forms from the very mild the severe and fatal; and the existence of cases hich are unrecognisable clinically is of course an er-present peril. But if they can be diagnosed rrectly and if (as we earnestly hope) HINDLE'S ccine is capable of immunising large numbers of ople without difficulty or danger, the problem of llow fever in Africa will be well on the way to lution, and we shall be able to wait with equanimity r further light upon the characteristics of the usal virus.

"MASTERLY INACTIVITY" IN THE TREATMENT OF SYPHILIS.

LAST week we gave an account of some Norwegian udies in syphilis which raise again the question of te neuro-syphilis in relation to the modern treatment the disease. The late CÆSAR BOECK, professor of rmatology in the University of Christiania (Oslo), ed to teach that the so-called specifics, potassium dide and mercury, are symptomatic remedies which ot only fail to eradicate the disease, but also paralyse ne body's natural defences, with the result that the isease runs an atypical course and inflicts serious juries on certain internal organs, particularly the ntral nervous system. The validity of this theory as tested by two of BOECK'S successors, Prof. BRUUSGAARD and Dr. S. DAHLSTRÖM, and the results f their investigations are very striking. Of 2181 atients suffering from primary and secondary yphilis who had attended BOECK'S clinic between the ears 1891 and 1910 and were treated by BOECK'S ethod of "masterly inactivity," only 0·6 per cent. eveloped general paralysis and half that number ffered from tabes. In the discussion which followed rof. BRUUSGAARD'S paper Dr. DAHLSTRÖM pointed ut that the commonly accepted computation of the equency with which cases of syphilis end in general aralysis is about 4 per cent., and that during the 3 years he had been practising as a psychiatrist he ad been on the look-out for paretics among BOECK'S d patients, but had found hardly any, whereas atients who had been treated with mercury frequently appeared with signs of general paralysis.

The whole question of the anti-syphilitic remedies as often been revived since the introduction of the ewer methods of treatment with salvarsan or one its many derivatives, and with bismuth. Many uthorities hold the view that this treatment has sulted in more cases of late neuro-syphilis, while ther equally competent observers maintain the verse, and affirm that many of the cases which do cur result from insufficient treatment of the disease its secondary stage. It is well known that unless aximal doses of the drug are given sufficiently often a course, and without too long an interval between ne courses, arsenic-resistant strains of the spirochæte ay develop in the body, and ultimately these may produce neuro-syphilis and other visceral lesions. In order to prevent this untoward event efficient treatment with mercury or bismuth is recommended either concurrently with the arsenic or subsequently, and between these combined courses the administration of large doses of iodides is advised. It appears that the modern antispecific treatment of syphilis is receiving somewhat of a check, for it is now recommended by some continental authorities that non-specific remedies—and notably malarial therapy, which has already achieved such remarkable success in the treatment of general paralysis—should be employed in the treatment of early syphilis. KARL ZIELER, who has recently written upon this subject,[1] is of opinion that malarial therapy is not a method suitable for general application and that it can only be used in hospitals. Moreover, he says, it does not always prevent subsequent neuro-syphilis, and it should only be used, he thinks, when ordinary treatment has failed to render the cerebro-spinal fluid Wassermann-negative.

The problem of the conflict between the invading spirochæte and the defensive mechanism of the invaded body, and the ultimate effect of our interference, either by the older methods of treatment with mercury and iodides or the newer methods with salvarsan and mercury or bismuth, is worthy of closer study. So far as we are aware there are no figures at all comparable with those of BOECK'S available in this or any other country, and it would probably be difficult in the present state of medical opinion to find practitioners bold enough to adopt BOECK'S method of treating syphilis by withholding all the recognised antispecific remedies and simply maintaining the patient's defensive mechanism. It should be possible, however, to follow up the after-histories of a specified group of syphilitic patients who had received adequate treatment with modern anti-specific remedies, with the view of ascertaining what proportion of these patients are showing signs or symptoms of late syphilis of the central nervous system or other viscera. L. W. HARRISON estimates that during the war 100,000 men in the Army received treatment for syphilis, but most of these, of course, are now absorbed into civil life and could not be traced. It should be possible, however, to follow up the cases which occurred in the Navy, and valuable information might thus be obtained by which an authoritative reply to this very important question could be given. Syphilis still presents many problems which in the present state of our knowledge (or ignorance) elude solution. Why is it that the disease as we see it to-day is so much less virulent than it was 30 or 40 years ago? Is it because we are becoming to some extent immunised or that the spirochæte is becoming attenuated, perhaps as the result of the modern methods of attack? How can we explain why (as sometimes happens) only one child in a family suffers from congenital syphilis, with healthy brothers and sisters older and younger than itself? Why is it that the mothers of congenitally syphilitic children, though they are usually Wassermann-positive, rarely give a history of primary or secondary lesions or indeed of any ill-health? What is the significance of the fact noted by P. C. JEANS in America, and DAVID NABARRO in this country, that 70 or more per cent. of the fathers of syphilitic children give a negative Wassermann reaction and often deny any history of infection or of treatment? It must be left to the future to furnish the answers to these and other important questions.

[1] Deut. Med. Woch., June 22nd, 1928.

Annotations.

"Ne quid nimis."

VITAL STATISTICS FOR 1928.

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infantile mortality during the year 1928.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales ..	16·7	11·7	65
107 county boroughs and great towns including London	16·9	11·6	70
156 smaller towns ..	16·7	10·6	59
London	15·9	11·6	67

The smaller towns are those with a population in 1921 of 20,000–50,000. The death-rate for England and Wales (which is based on the estimated population in 1928) relates to the whole population, but that for London and the two groups of towns (based on the 1927 estimate) relates to the civil population only. Birth-rate and death-rate are per 1000 population, infant mortality-rate per 1000 live births.

The Registrar-General remarks that the birth-rate is 0·1 per 1000 above that of 1927. The death-rate is 0·6 per 1000 below that of 1927 and only 0·1 per 1000 above the lowest recorded (1923 and 1926). The infant mortality-rate is the lowest on record, 4 per 1000 births below that of 1923. These provisional figures, which are not likely to require substantial modification, have been issued for the information of medical officers of health.

INTRAVASCULAR CLOTTING.

THROMBOSIS is stated to occur in something over one per cent. of all operations, and the same incidence seems to hold good for parturition. If the suggestion of F. de Quervain is accepted that a considerable proportion of the cases of post-operative pneumonia is due to the formation of thrombotic emboli thrombosis may be an even more common sequel of operation than is suspected. There is no indication that the incidence of post-operative thrombosis has diminished within the last 20 years. Indeed, in Germany it is stated to show a considerable increase since 1922. In any case the problem of the causation of this condition is of sufficient importance to arouse the interest of surgeons and obstetricians. The recent discussion on this subject by the combined sections of Obstetrics, Surgery, and Pathology of the Royal Society of Medicine, of which a report is given in another column, has shown that clinical evidence is unable to throw much light on the problem and that its solution must come from the laboratory. Indeed, the most important contribution to the discussion did come from the laboratory in the opening remarks by Dr. W. Howel Evans. The observations of Dr. Evans and his collaborators have recently been published,[1] and were then the subject of a detailed review in our columns.[2] It is, therefore, only necessary to state briefly that in a large number of operations a great increase in the number of blood-platelets was found to occur after the operations, and the same was observed after childbirth. The rise begins about the fourth day, increases to a maximum about the tenth day, and then falls slowly back to the normal level. The rise in the platelet count was accompanied by a shortening of the coagulation time of the blood when measured outside the body. It is remarkable that, clinically, thrombosis occurs most frequently at about the time that the rise in the platelet-count reaches a maximum. It must be noted that none of the surgical cases in which the platelet counts were made developed thrombosis. Dr. Evans expressed himself very cautiously in appraising the significance of this new and important observation, and it is clear that further investigations are necessary to determine whether a platelet rise above a certain limit is in itself sufficient to induce thrombosis or whether additional factors are involved in it. But his work has opened up a way of attacking at least one aspect of the problem by experimental methods. By performing operations on animals it may be possible to determine the factor, or factors, responsible for the post-operative rise in the blood-platelets. The suggestion by Mr. D. H. Patey that stasis of the circulation plays an important part in the onset of thrombosis seems well founded. It is important from the practical point of view, because it offers a means of preventing thrombosis by avoiding conditions favouring stasis. On the other hand, the suggestion made by another speaker of injecting anticoagulants would hardly be justified in the light of our present knowledge of the mode of action of these substances. The action of such a substance as heparin is transient, lasting only for a few hours, and is followed by a reaction in the opposite direction, as a result of which the coagulability of the blood is increased.

It may seem curious that the ætiology of thrombosis is so little understood when the physiological literature on blood coagulation fills literally volumes. But as pointed out recently by Dr. J. W. Pickering in his excellent monograph,[3] "The Blood Plasma in Health and Disease," physiological and biochemical work on blood coagulation is, with very few exceptions, characterised by a disregard of the blood-platelets. Indeed, in this country, with the single exception of the Edinburgh School of Physiology where, under the influence of Sir Edward Sharpey-Schafer, histology has been taught as an integral part of physiology, and where the work of W. Cramer and of J. Tait has demonstrated the important part played by the platelets in blood coagulation, physiologists have categorically denied the presence of blood-platelets as living cellular elements existing in the circulating blood. It is to be hoped that this discussion, by emphasising the importance of the blood-platelets in the ætiology of an important pathological lesion, will help to remove this erroneous teaching and stimulate further research into the physiology of the blood-platelets.

THE CENTRAL ASSOCIATION FOR MENTAL WELFARE.

IT is characteristic of our country that much of the best and most of the pioneer social work is carried out by voluntary bodies which are remarkably efficient and well organised. An example of fine voluntary work for the public health is afforded by the Central Association for Mental Welfare (C.A.M.W.), which continues to point the way to long-overdue legislation for the subnormal population. The Mental Deficiency Bill passed through Parliament at the end of 1927 largely owing to the unremitting efforts of the Association's members. During the following year work was organised in three areas where the local authorities have not been able to administer the Mental Deficiency Act, and central organisers stayed in the districts until a local organisation was well established. A valuable department of the work is the educational courses provided for all whose work brings them into contact with defectives. The report states that it is increasingly difficult to find experienced and competent people to fill administrative teaching and nursing posts as they fall vacant

[1] Jour. Path. Bact., 1928, xxxi., 883.
[2] THE LANCET, 1928, ii., 982.
[3] William Heineman n, London, 1928.

representations have been made to the University of London, urging the authorities to institute a post-graduate course of psychiatric training for social workers; courses have been held by the Association, and workers have been trained at the central office. A special course was held in May for medical men and women; 28 of the 45 who attended were school medical officers. Another course was held for magistrates and was greatly appreciated. The courses for teachers are well established and over 1,000 teachers have now been through them, but there is still an inadequate supply of suitable workers for special classes of dull and backward children. A variant of the teachers' course was held at the request of the Board of Control for inquiry officers and supervisors of occupation centres. There are now 109 occupation centres in England and Wales, most of them under the direct management of their local associations. Four new centres were opened during the year under review—a feat which involves a great deal more work than most people would imagine. Before a centre can be opened numbers of children have to be visited, those suitable for the centre have to be selected, parents' consent has to be obtained, premises found, committee formed, grants obtained, staff trained and appointed, and arrangements for transport made. The guardianship scheme is, in the absence of institutional accommodation, the most fruitful method of dealing with defectives. The C.A.M.W. has now made its scheme self-supporting and so extensive that an assistant officer has become necessary. The work at the office shows no sign of diminishing, but it is interesting to learn that far more "better-class" parents now apply for advice. It is no easy task to find a suitable institution for a defective, even for families who can afford to pay, but the Central Association has all the information docketed, and can often direct guardians to the most suitable colony or home. A register of nurses and governesses is also kept, but here, again, the demand greatly exceeds the supply. Certain trades employ large numbers of defectives, and the association is naturally anxious to have access to their records. Up to date three of the principal trade-boards have agreed to give information and four others are willing to supply figures without names. A hopeful offshoot of the Association is the Child Guidance Council, now a separate organisation with its own Council, offices, and staff. As is well known, the Commonwealth Fund of America is coöperating with this Council, and a Child Guidance Clinic is to be opened in London shortly. Five of the C.A.M.W. social workers have had a year's special training at the New York School of Social Service at the expense of the Commonwealth Fund, and the Secretary, Miss Evelyn Fox, has paid a three months' visit to various centres of work in America.

ICTERUS NEONATORUM.

THE origin of the so-called physiological jaundice of the newly born presents a problem which is still to a large extent unsolved, while a constant succession of theories has kept alive the interest which has been taken in it by the physiologist and the physician. Since the days of Morgagni, who attributed it to plugging of the bile-duct by milk curds—a view amended by Virchow to a similar action of mucous plugs—a series of explanations have been propounded of which few have stood the test of time. In recent years explanations which refer the origin of the jaundice to the alimentary tract have receded from favour, the field being occupied by two principal theories—namely, hæmatogenous and hepatogenous origin. The balance of opinion, at any rate in this country, has favoured the former view, in some degree as a result of the confirmation given to it by the Van den Bergh reaction. Nevertheless the hepatogenous view, in favour of which A. Yllpö has adduced much cogent reasoning, has not been without its supporters. Prof. P. Lereboullet,[1] who has long been a contributor to the literature of the subject, suggests in an interesting review that the hæmatogenous and hepatogenous theories are by no means as mutually exclusive as has been represented by their respective exponents. From the clinical aspect Prof. Lereboullet reminds the reader of three important facts: (1) that the icterus is preceded by an erythrodermic phase; (2) that the fæces are not decolorised; and (3) that the jaundice is in most cases acholuric. Its occurrence is especially frequent in twins, and in infants born prematurely or after difficult labour. The most important fact established by experiment is that the blood of the infant at the moment of birth contains bile; there is a physiological bilirubinæmia independent of the subsequent development of jaundice. It is also found that the blood of the cord contains less bile than that of the fœtus, and the maternal blood contains three times less bile than the blood of the cord. Hence it may be inferred that the blood returning from the placenta loses some of its bile-pigments in the maternal circulation, and that from the point of view of the fœtus the cord represents the main path of excretion of bile-pigments, only a portion passing into the meconium. It is undoubtedly true that a tendency to hæmolysis is present in the first few days of life; that is seen in the erythrodermic phase which so often precedes jaundice and which may be attributed to hæmoglobinæmia. These two factors, hyper-hæmolysis and hyper-cholæmia, are therefore present in *normal* infants after birth. At birth the ligature of the cord puts an abrupt termination to the path of excretion of the greater part of the fœtal bile. As a result of this, the bile content of the blood rises, just at the moment when the existing number of the red corpuscles is becoming in excess of the infant's requirements. The kidneys have not as yet acquired the faculty of excreting bile, as is shown by the acholuric type of jaundice. The liver is in process of acquiring this faculty, but jaundice will occur in infants in whom it is not acquired with sufficient rapidity to keep pace with the hypercholæmia occasioned by ligature of the cord and accentuated by hæmolysis.

[1] Paris Médical, Nov. 3rd, 1928.

DUST AND TUBERCLE.

THE evil effects on the respiratory system of the inhalation of various forms of dust have been recognised for many years. Clinical and pathological investigations have shown that while some dusts are relatively innocuous, others, notably the hard silica dusts, produce profound changes in the lungs and influence very definitely the development of certain infections, especially tuberculosis. This much is generally accepted, but the exact method by which the pulmonary changes are brought about is not yet settled. And there is still less agreement as to the way in which the silica helps in the progress of the tuberculous process. The matter has been subjected to experimental investigation by many workers but with inconclusive results. It is easy enough to show that silica has a deleterious action on the tissues of the body, which, if continued, is followed by extreme fibrosis; and it can also be demonstrated in laboratory animals that the presence of silica increases the pathogenicity of the tubercle bacillus. But the production of the pulmonary lesions with which we are familiar in stone-masons and quartz-miners has yet to be achieved. The difficulty probably lies in the choice of the experimental animal. Rabbits and guinea-pigs can be exposed to dust atmospheres containing a vastly greater concentration of silica than any to which an industrial worker would ever be subjected, but they do not develop the characteristic pulmonary lesions. Such an experiment has been described in the *American Review of Tuberculosis* by H. S. Willis.[2] Guinea-pigs were exposed to a concentrated atmosphere of silica in a dusting chamber for periods ranging from 24 to 37 months. The exposures lasted for about three hours each day, for four or five

[2] Amer. Rev. Tuberc., 1928, xvii., 253.

days a week, the animals being in the chamber for roughly 50 hours a month. Even after three years of this treatment the animals showed surprisingly few pulmonary lesions. Moreover, subcutaneous inoculation with tubercle bacilli was not followed by more rapid or extensive tuberculosis in these animals than in controls. Negative observations of the kind are familiar to workers in this field. It may be that the upper respiratory tract of animals which normally carry their noses so close to the earth are so constructed that the air reaching the pulmonary alveoli is efficiently filtered. Or it may be that the respiration of animals quiescent in the dusting chamber is abnormally shallow. Whatever the reason, it is clear that the experimental conditions do not represent those occurring in the dust industries. Negative results must not be regarded as disproving our present conceptions of the pathology of miners' phthisis, for the positive evidence available is far too abundant to be upset by what are clearly imperfect experiments. On the other hand, the prevention of pneumokoniosis in dangerous industries has steadily progressed in recent years. In a report [3] recently published by the Miners' Phthisis Medical Bureau of South Africa the measures taken for the detection and prevention of this disease are recorded in detail, and in an address [4] delivered by Dr. L. G. Irvine, chairman of the Bureau, the matter is discussed in more general terms. The work of the Bureau is well known, and we are glad to hear from Dr. Irvine that the present position is more satisfactory than for many years. Improved methods of diagnosis have resulted in the detection of many cases of silicosis in the earliest stages, which formerly would not have been recognised, and thus the apparent incidence of the disease has increased. In spite of this the latest recorded figures show less silicosis among the Rand miners than was to be expected from the experience of previous years. Silicosis and tuberculosis run closely together; the dust factor in the Rand mines has already been dealt with very effectively, and unceasing care is exercised to see that the atmospheric conditions underground are as good as they can possibly be. The control of tuberculosis underground, which practically means the detection of the "carrier," is also receiving the most careful attention, and it is not unreasonable to hope that the incidence of miners' phthisis will diminish still more in the future.

PRESCRIPTIONS FOR NASAL CATARRH.

DURING the recent wave of infectious colds over the American continent it is reported that persons who performed a nasal toilette in public were looked at askance and that a sneeze was tantamount to exclusion from a theatre. Nasal catarrh, however, is not an ailment for which many effective remedies have been discovered, and certainly very few are universally recognised. An Italian proverb states that a cold when left alone runs for 21 days and, when treated, for three weeks. Nevertheless there are certain procedures which, if applied early, can shorten matters. It is agreed that a cold may sometimes be nipped in the bud by a good sweat, induced by a cabinet, a hot bath, or a pile of blankets, assisted by an antipyretic. Prof. H. Beyer, who has given prolonged study to the prevention and treatment of *Schnupfen* in Berlin, has recently set out his experience [5] in a form which may be of use to others at the present time. At the outset, while there is still hope of aborting the cold, he recommends: calc. lact. 4·0, dionin 0·4, made up to 100·0 with half-and-half raspberry syrup and water, the whole amount to be taken in the course of the day. Mild anæsthetic sprays and the insertion in each nostril for an hour or two of a plug of cotton-wool steeped in 20 per cent. ichthyol solution, may also avert the attack. Prof. Beyer also mentio Brüning's local light bath, which is applied to the fa while the patient, in a recumbent position, breath through a glass tube. It raises the local temperatu to about boiling-point without serious inconvenienc and avoids the disadvantages of a general applicatio of heat. If these methods are unsuccessful, the patie should, he says, remain in bed, the swelling ar secretion of the nasal area being treated wit inhalants such as lysoform, or acid. carbol. liq liq. alum. acet., of each 5·0, in 15·0 of rectifie spirit and 10·0 of distilled water. Ten drops a placed on a piece of wadding and inhaled. Cocaine i minute doses affords relief, and the danger of misha is negligible. A good nasal snuff is given as: co mur., menthol, of each 0·1 in 10·0 of milk suga and some firms market a composition of cocaine wit menthol and adrenalin. Menthol, in a 0·2 per cen solution with liquid paraffin, is said to be good, bu must never be given to infants. In children th condition should be regarded with still more respec as the obstruction may lead to suffocation, convulsion or the inhaling of the tongue, and the infection itse may be serious in a weakly or predisposed child Rubbing with wool soaked in equal parts of spirit an glycerine, and moistening the air with the steam o boiling water containing some menthol crystals ar both useful measures. Fever should be treated wit 1·5 of pyramidon once or twice a day, or in childre over six months with half a tablet of aspirin. T mitigate breathlessness in sucklings at feeding tim due to nasal swelling, a mixture of adrenalin 1–100 one part, borated water two parts, may be droppe into the nose. Nose-bleeding during a cold in infant sometimes points to diphtheria or syphilis. Diphtheri carriers often suffer from an outbreak of their specifi fever disguised as catarrh, in which purulent epistaxi replaces membrane building; loss of appetite alimentary troubles, and dyspnœa from membran soon betray the condition. The local applicatio recommended is one also used as a routine prophylaxi for carriers—namely: protargol 3·0 dissolved i 5·0 of cold water and incorporated in lanolin 10·0 vaselin. flav. 30·0. The dangerous gangrenous form of nasal diphtheria is not common, but should b borne in mind as a reason for assiduous local treat ment. Syphilitic colds break out a fortnight befor the rash and differ from ordinary catarrh in a much more pronounced swelling of the nasal mucosa, which secretes large quantities of reddish-brown pus, which may flow down the nose and stain the face. When the ordinary treatment of catarrh fails it is worth while trying an ointment made up as follows: hydrarg præcipit. alb. 0·2, lanolin 3·0, paraff. liq. 2·0. This should be applied to the nostrils once a day with a spatula. For sinus infection Dr. Beyer recommends the local light bath, along with a mixture containing pot. iod., sod. iod. of each 5·0 in aq. distill. 20·0 of this 5–10 drops are taken in milk three times a day Saline douches, assisted by laxative mineral water to avoid hyperæmia of the mucosa, should be used in all catarrh; glycerine tampons left in place for half an hour and hydrogen peroxide douches will relieve the thick secretion and fœtor which follow ozæna, after which tampons soaked in eucupin 2·0 with aq. distill 40·0 and lanol. ad. 100·0 are applied. Practitioners may find useful some of these prescriptions, which are throughout transcribed in metric form.

THE ARMY MEDICAL SERVICES.

SOME confusion has arisen following the announcement, in our issue of Dec. 15th, 1928 (p. 1262), concerning an Advisory Board and a Consultative Committee in connexion with the Army Medical Services. The establishment of an Army Medical Directorate Consultative Committee is quite independent of the reconstitution of the Army Medical Advisory Board It will be remembered that after the war the members of the Board, at that time Lord Dawson, Sir Berkeley Moynihan, Sir Robert Jones, Sir Harold Stiles, Sir William Horrocks, and

[3] Union of South Africa: Report upon the work of the Miners' Phthisis Medical Bureau for the year ended July 31st, 1927. Pretoria: Government Printing and Stationery Office. 1928. Pp. 61. 5*s*. 6*d*.

[4] Present Position of Miners' Phthisis on the Rand. An address to the Association of Mine Managers. By L. G. Irvine, M.D., B.Sc. (Obtainable from the Bureau.)

[5] Deut. Med. Wochens., 1928, liv., 512.

the President of the Medical Board at the India Office (ex officio for Indian affairs), ceased to be paid but continued to give voluntary service. The Board met seldom during the succeeding years except to advise the Secretary of State on the appointment of Director-General, and in 1928 Sir Robert Jones and Sir Harold Stiles retired from its deliberations. It was then recognised that the terms of reference of the Board required amendment and that men in civilian consulting practice were unable to give up the time necessary to carry out all the duties which then devolved upon the Board. At the same time many other questions, such as the lack of candidates for the Royal Army Medical Corps, post-graduate instruction, and the future prospects of the Corps, were presenting themselves on which the Director-General wanted the constant advice and help of the civil profession. For these reasons it seemed desirable to establish a board or committee covering a wider sphere of the civil profession and with more members, so that the Director-General could have more frequent meetings with at any rate a proportion of the members. The Secretary of State therefore decided to retain the Army Medical Advisory Board of four civilian members to advise him on matters of policy vis-à-vis the civil profession, and to constitute a new committee to be called the Army Medical Directorate Consultative Committee, with the Director-General as chairman, to discuss matters of departmental rather than general interest. The members of this committee were chosen to cover as wide a field as possible and in particular to secure liaison with the medical schools. As we have already stated, they consist of Major-General H. B. Fawcus (vice-chairman), Prof. J. Barcroft, Lieut.-Colonel Sir Robert A. Bolam, Colonel Sir E. Farquhar Buzzard, Colonel T. R. Elliott, Captain J. Fraser, Colonel G. E. Gask, and Colonel A. E. Webb-Johnson, with Major C. M. Drew as secretary. Hygiene, pathology, and radiology are not represented on this Committee since there already exist strong advisory committees on these subjects. One of the most pressing needs of the Medical Services of the Army is an adequate supply of candidates and this will be one of the first matters to be discussed by the Committee. It is expected that visits will be paid to the military hospitals by members and that much valuable advice will be obtained. It is clear that the Board and the Committee are quite distinct from each other and have no interdependence. The Board acts in an advisory capacity to the Secretary of State, and the Committee to the Director-General of Army Medical Services and through him to the Adjutant-General and the Army Council.

DRUGS FOR INSURED PERSONS.

THE memorandum recently issued by the Medical Practitioners' Union seems to be founded on a misconception of the arrangement made between the Ministry of Health and the Retail Pharmacists' Union. For some time past in most if not all of the insurance areas analysis has shown that the cost of the actual drugs is less than the amount paid to the chemists for dispensing them. Now the sum of money allocated to the drug fund as part of medical benefit is a fixed quantity, and the arrangement with the chemists implies that in accepting the whole of this sum they are taking the risk of a loss or a surplus according to the amount required for the supply of medicine to the insured population for any year. As far as the year 1928 is concerned the chemists will probably receive the whole of the cost of the drugs plus their dispensing fees to within a small percentage of the full amount. To put it in a sentence, the chemists' bills are discounted on the payment for services rendered, but are paid in full as far as the cost of the drugs is concerned. It seems therefore hardly fair for the Union to say that the control of the drug fund has been "handed over by the Minister of Health to the Retail Pharmacists' Union," and the statement that "the amount of medicine for the insured is strictly conditioned by what is left over after a working profit is provided for the pharmacist" does not represent the facts of the case. The amount of medicine is conditioned solely by the clause in the Act of Parliament which guarantees proper and sufficient medicine for adequate treatment. What is proper and what is sufficient is determined and can only be determined by insurance practitioners themselves. Even in a case investigated under the regulations for alleged excessive prescribing the determination and decision are in the hands of the practitioner's colleagues on the local panel committee. It may be remarked that the attempt at restriction made by the London Insurance Committee recently has apparently been given up. The report of the last meeting of the London Panel Committee indicates a determination to leave the ordering of any remedy to the absolute discretion of the practitioners themselves. We commend the Union for its jealous watch over the interests of medical practice; in this matter, however, there seems no ground for anxiety.

ŒDEMA IN EXOPHTHALMIC GOITRE.

As long ago as 1897 Hector Mackenzie pointed out [1] that œdema may appear in several phases of Graves's disease. The illness may be heralded by a slight general œdema; during the course of the malady a very persistent local œdema may affect the eyelids; sometimes a curious swelling is met with in the lower extremities, resembling the swelling of myxœdema in being firm, non-pitting, and yielding no fluid on acupuncture; very occasionally puffy urticarial lesions are seen at the onset of severe cases. A solid infiltrated type of œdema is described as not uncommon in most English text-books. Œdema of cardiac origin is of course well known. A complete and erudite account of the whole subject has lately appeared [2] from the pen of Dr. Malte Ljungdahl, of Malmö, Sweden. The writer reviews the literature back to Mackenzie's article, mentioning Maude's original classification into Œdema of cardiac origin, Œdema of "nervous" origin (which would now be called "vasomotor"), and Patchy and fugitive types. He describes fully and clearly six cases of his own showing well-marked œdema and bases on these three types of œdema—namely: (*a*) œdema dependent on stasis and cardiac failure, especially failure of adequate diastolic filling; (*b*) œdema in circumscribed zones as described by Quincke; and (*c*) a firm, non-pitting œdematous infiltration of the skin in certain sites, notably the eyelids and the legs. The exact causation of the œdema under the two latter rubrics is not clear, but Dr. Ljungdahl suggests that it is part of the toxæmia of which hyperthyroidism is itself a manifestation. This view is supported by the fact that the lesions in type (*b*) may be indistinguishable from those of erythema multiforme. All three types of œdema may be prolonged, considerable and relapsing without prejudice to the prognosis—a fact on which the author lays much stress. Along with the œdema may appear icterus, scleroderma, or pigmentation as allied phenomena. In regard to treatment, Dr. Ljungdahl regards iodine as specific for all such œdematous states, and his charts illustrative of the diuretic effects of this drug are very striking. Three drops daily of Lugol's solution rapidly increased to 18 or more drops will resolve the œdema besides bringing about a general amelioration in the symptoms and a lowering of the metabolic rate. If icterus is present it also will yield to iodine. The value of iodine in Graves's disease has long been known; although its mode of action is still unsettled, it is frequently given as a preliminary to thyroidectomy. American experience was recently reviewed in these pages.[3] Dr. Ljungdahl's work is a welcome addition to our knowledge.

[1] Edin. Med. Jour., 1897, xliii., 401.
[2] Wien. Archiv. für Innere Medizin, 1928, xvi., 1.
[3] See THE LANCET, Jan. 5th, p. 57.

COUNTY HOSPITALS IN THE IRISH FREE STATE.

AT the meeting of the Council of the Irish Medical Association held last week attention was given to the present condition of many of the county hospitals, and the following resolution was passed :—

"The Council of the Irish Medical Association has had under consideration the unsatisfactory conditions under which the surgeons of many county hospitals are expected to do surgical work. In many cases there has been no structural alteration for generations, and in few is there adequate equipment. At the same time surgeons are pressed to undertake major surgery which cannot be done with due regard to the welfare of patients. The condition is such as to demand immediate attention."

When the public medical services of Ireland began to undergo reform some seven or eight years ago, it was an essential part of the scheme that there should be in each county a county hospital capable of dealing with the ordinary surgical work of the county. With this end in view, as vacancies occurred in the position of county hospital surgeon, superior surgical qualifications were demanded from those who sought appointment. It was assumed that the hospitals would be so equipped that surgical work should be done in accordance with modern requirements. In 1924, in its memorandum of evidence submitted to the Committees of Inquiry on National Health Insurance and the Medical Services, the Department of Local Government and Public Health stated that the necessary development had taken place, and that the hospitals were provided with the scientific equipment essential to the performance of their duties. Verbal evidence submitted later by the Department's officials failed to substantiate this claim, and even at the present day comparatively few of the county hospitals are equipped in such a way as to justify the performance of major surgical operations. At the same time the surgeons are criticised by their boards of health if they think fit to refer patients for major operations to the city hospitals. The surgeons have also another, and a more personal, grievance. Many of them, writes our Dublin correspondent, were appointed with a definite promise that provision would be made in the hospitals for the accommodation of private patients, who, in addition to paying for their accommodation, would pay fees to the surgeons. This promise affected the salaries accepted by the newly appointed surgeons. In few cases, however, has the promise been fulfilled and regulations adopted to govern the admission of private patients. The net result is that the health authorities, failing to fulfil the promise made, have obtained the surgeons at lower salaries than would have been accepted had the promise not been made.

THE VIRULENCE OF THE BLOOD IN TUBERCULOSIS.

AN interesting investigation into the virulence of the blood of tuberculous subjects has been performed on a large scale by Dr. R. Pla y Armengol.[1] He has confirmed by numerous experiments his discovery that blood taken from a guinea-pig 24 hours and onwards after the animal has been injected with caseous material or with tubercle bacilli is uniformly fatal to healthy guinea-pigs. Some die in a week, others after two or three months. Only in a very small percentage of cases do the guinea-pigs develop typical tuberculosis. In the rest no tubercles develop and no Koch's bacilli are found, but the animals show a progressive wasting. Details of autopsies are not supplied, but it is stated that the lymph glands are usually normal. The blood of 27 patients in whose sputum tubercle bacilli had been demonstrated was also regularly fatal to guinea-pigs. When the batch of animals into which this human blood was injected were just dead or dying, 2 c.cm. of blood from each of them was injected subcutaneously into other guinea-pigs, with uniformly fatal results. This passage was repeated three times in each case. Among the whole series of guinea-pigs, of which 675 were used in all, the injection was fatal in all but nine.

Dr. Armengol suggests that the experiments prove the constant presence in the blood of tuberculous animals of a living organism which is able to multiply in the body, and he believes this to be the tubercle bacillus in another form. This argument really turns on the fact that he failed to find Koch's bacilli or the usual lesions in the majority of the animals. It is admittedly sometimes a laborious task to demonstrate tubercle bacilli in lesions which are known to be tuberculous; there is rarely, however, any difficulty if the animal dies of the disease. Similar observations to those of Dr. Armengol have been made before, but the usual explanation given has been that of intercurrent or secondary infection. This Dr. Armengol rejects because of the regularity with which a fatal result occurs. The objection is reasonable, but his article would have had more value if he had supplied more information about control experiments. It is possible that we are dealing here with the filterable form of the tubercle bacillus (Fontes) whose existence has been supported by the work of Vaudremer, Valtis, Calmette, and others.

[1] Publicaciones del Instituto Ravetlat-Pla, Barcelona, October, 1928.

AT a meeting of representative dermatologists from Leeds, Liverpool, Manchester, and Sheffield held in Manchester on Jan. 15th, it was decided to expand the Manchester Dermatological Society into a North of England Dermatological Society. The Society, in addition to the annual general meeting, will hold four clinical meetings each year—one in Liverpool, one in Sheffield, and two in Manchester. The following officers were elected :—President: Dr. L. Savatard (Manchester); Vice-presidents: Dr. R. W. McKenna (Liverpool) and Dr. A. R. Hallam (Sheffield); Secretary: Dr. P. B. Mumford (Manchester); Members of Council: Dr. J. T. Ingram (Leeds), Dr. W. Dyson (Manchester), and Dr. G. H. Lancashire (Manchester). Any dermatologists, other than those already notified, in the North of England who would like to join, are asked to write to the Secretary, Dr. Mumford, 96, Mosley-street, Manchester.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments have been made:—Surg. Rear-Admirals: A. J. Hewitt to *Pembroke*, and H. C. Whiteside to *Victory*, for R.N. Hospital, Haslar; Surg. Lt. J. W. Nesbitt to *Pembroke*.

ROYAL ARMY MEDICAL CORPS.

Capts. to be Majs.: J. P. Macnamara, J. W. Hyatt (Prov.) and remains secd., T. Stanton, and T. Parr (Prov.) and remains secd.

Lt. (on prob.) J. C. Gilroy, from the secd. list, is restd. to the estabt.

ARMY DENTAL CORPS.

The undermentioned Lts. (on prob.) are confirmed in their rank: H. L. Foulkes-Roberts, T. R. Wall, J. A. O'Connor, and H. S. Golding.

ARMY RESERVE OF OFFICERS.

Lt.-Col. G. B. Crisp, having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

ROYAL AIR FORCE.

Flying Officers J. E. Foran and M. O'Regan are promoted to the rank of Flight Lt.

RESERVE OF AIR FORCE OFFICERS.

Flying Officer W. B. Stott relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE.

Lt.-Col. R. W. Anthony to be Maj.-Gen.
Capt. G. A. Hildreth to be Maj.
Lt.-Col. J. B. Christian retires.
Temp. Lt. Prag Nath Kapur relinquishes his temp. commn.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XIX.

THE INTERPRETATION OF BLOOD-SUGAR ESTIMATIONS.

THE presence of an adequate amount of sugar in ne blood is essential for life and its many activities. lthough the blood-sugar increases after a carbo- ydrate meal no sugar is excreted in the urine of ost healthy people. The presence, therefore, of a educing substance in the urine which has been proved be dextrose should always arouse suspicion and n estimation of the blood-sugar should be made. Whether a glucose-tolerance test need be performed epends on the amount of sugar in the blood, as will e seen below.

Collection of Blood.

The time at which the blood should be collected is ery important. If the examination is being made for he purpose of establishing a diagnosis when sugar has een found in the urine, the blood should be collected ne to two hours after a meal at which at least 2 oz. of read have been eaten. This is essential in the mild ases, since the blood-sugar may only be raised for a hort time, and a wrong diagnosis has been made by ollecting the blood some hours after the meal or after period of strict dieting. If the case is a severe one, he blood-sugar will probably be raised throughout the ay and the blood can therefore be collected at any ime.

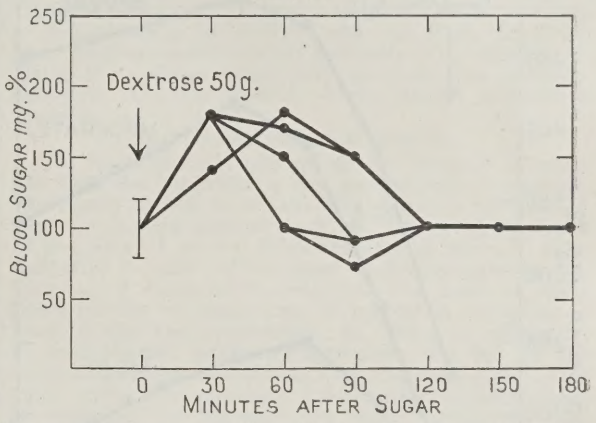
If the patient is having insulin, the blood must also e collected at a definite time. It should be collected 1) before the morning dose of insulin if it is desired to now whether the blood-sugar has been brought down o normal at the beginning of the day. If it is nconvenient to see the patient before breakfast, a arbohydrate-free meal should be eaten and the blood ollected as soon as possible after it, and the insulin nd usual carbohydrate given later. (2) The blood hould be collected three to six hours after the insulin o as to make certain that the response to the insulin s the correct one. (3) It may be necessary to collect he blood again immediately before the evening ose of insulin. The information obtained at hese three times gives the best indication of the eaction of the patient to insulin, though it must e admitted that it is possible to gauge the correct ose of insulin with very few blood-sugar estima- ions. After the dose of insulin and the diet ave been stabilised, one of these times should be hosen, the blood for testing should be collected lways at this time, so that the progress of the case an be assessed. If a gain or loss of sugar tolerance as occurred, it is sometimes of assistance to estimate lood-sugar at all three times in order to adjust the ose of insulin.

Collection of Blood.—The blood can either be ollected from a vein by means of a sharp needle and yringe or from the capillaries of the ear-lobe or nger. If the finger is used, it is important to place he hand in hot water, so as to make certain that the kin is hot and contains plenty of blood. The best eedle to use is the "blood gun" recommended by rof. Herrmann Sahli. After the prick has been ade a piece of fine rubber tubing should be wound ound the base of the finger in order to make the lood flow more freely. If the blood has to be ent by post to the laboratory, 2 to 5 c.cm. should e collected from a vein. In order to prevent he clotting of the blood and the disappearance f the sugar, a mixture of potassium oxalate 4 parts nd potassium fluoride 1 part must be added. For 5 c.cm. of blood, 0·02 g. of the mixture is sufficient; and this can be roughly measured on the point of a large pocket knife. The blood should be placed in a tube or bottle and then in a small tin to prevent any risk of breakage.

Normal Values.

To interpret the result of a blood-sugar estimation correctly the normal variations in the amount of sugar in the blood must be understood both in health and disease (see Fig. 1). When a healthy person has had no food for three or more hours the sugar in the blood varies from 80 to 120 mg. (0·08 to 0·12 g.) per 100 c.cm. [It is better to express the result in milligrammes—e.g., 95 per 100 c.cm. instead of as a decimal part of a gramme—e.g., 0·095 per 100 c.cm., because it is much easier to use a whole

FIG. 1.



Normal variations for capillary blood. (For venous blood the readings are 20–30 mg. lower.)

number and less likely to cause mistakes.] After a dose of 50 g. of dextrose taken by the mouth, or after a heavy carbohydrate meal, the blood-sugar increases rapidly, and may have begun to rise after 10 mins.; it usually reaches a maximum after 30 mins., and may have returned to the fasting value after 60 mins. The usually accepted maximum for capillary blood of a normal person after 50 g. of dextrose is 180 mg. per cent., but it may be only 150 mg. or even less. The maximum figure may not be reached until after 60 mins., and the return to the fasting value may not take place until after two to three hours. The actual figures depend on whether the blood comes from the capillaries or veins. The capillary blood is identical with that obtained from an artery. When the patient is fasting the two estimation are identical, but after the dose of sugar the capillary blood is usually 20 mg. higher than the venous blood. Only the figures for the capillary blood will be considered in this article.

The Lag Curve.—A rare occurrence is a rise in the blood-sugar to 230 mg. after 30 minutes. Provided that the blood-sugar has fallen below 180 mg. after 60 minutes and below 130 mg. in 120 minutes, the sugar tolerance is regarded as normal, though it is advisable to repeat the test three months later.

Abnormal Values.

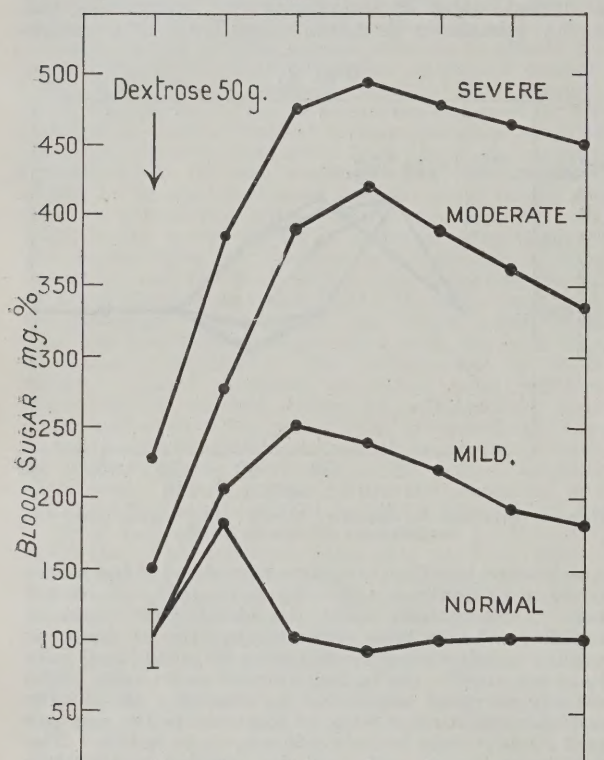
If a patient has a mild form (Fig. 2) of diabetes, the fasting value of the blood-sugar is often normal —i.e., below 130 mg. per cent.—but 30 mins. after 50 g. of dextrose it has usually risen above 200 mg. per cent. After 60 mins. it is usually still higher, and does not return to normal until more than three hours have elapsed. In a more severe case, the fasting value is often raised to 150 or 180 mg. per cent. and the blood-sugar may rise to more than 250 or 300 mg. per cent. after 30 mins. and over 400 mg. per cent. after 60 mins., and may not return to normal for several hours. If the initial value is over 200 mg. per cent. the blood-sugar may rise to more

than 500 mg. after 60 mins. A sugar-tolerance test should never have been asked for if the initial blood-sugar was over 200 mg. per cent., since this alone would show that the patient had a low sugar tolerance.

If an isolated determination of the blood-sugar is made, it is essential to know the nature and time of the last meal and whether the blood was collected from the capillaries or a vein.

If the blood-sugar is over 200 mg. per cent. 60 mins. after the last meal it is certain that the patient has a low sugar tolerance. If it is 180 mg. per cent.

FIG. 2.



one hour after a meal in which carbohydrates have been eaten, it is only suspicious, but if it stands at this figure two hours after the meal, the patient probably has a low sugar tolerance; but in order to prove it definitely the tolerance must be tested with a 50 g. dose of dextrose. If, however, the blood-sugar is 180 mg. per cent. three hours after a meal, the patient certainly has a low sugar tolerance.

It should be remembered that although the blood-sugar of a normal individual is not raised above 180 mg. per cent. after meals, it is sometimes raised above 200 mg. in moments of excitement and nervous strain when glycosuria may occur. It is also sometimes altered in certain diseases. Thus a severe carbuncle or numerous boils may cause a rise in the blood-sugar and sugar may even appear in the urine, although the sugar tolerance, both before and after the illness, is apparently quite normal. Such an observation should, however, raise the suspicion that the sugar tolerance is rather lower than that of most individuals. When the patient has a definitely lowered sugar tolerance, especially if it is sufficiently low to need insulin to keep the blood-sugar within normal limits, any infection may cause a rise in the blood-sugar and the presence of sugar in the urine. A severe infection may precipitate the onset of coma. Diseases of the thyroid gland, like exophthalmic goitre and myxœdema, may cause a lowering of the sugar tolerance, and in these conditions the sugar-tolerance curve may show a rise above 200 mg. after 30 mins. and the return below 200 mg. may be delayed for two or more hours. The blood-sugar of a healthy person may be lowered in extreme exhaustion—e.g., during a Marathon race or after an excitement is over. Moderate exercise may cause hypoglycæmia in patients who are having insulin, and it is more likely to occur three to six hours after the injection of insulin. They should be warned of this complication.

Relation of Glycosuria to Glycæmia.

Sugar is not detected in the urine by the ordinary tests unless the blood-sugar rises above 180 mg. per cent. This level is termed the threshold of the kidney. It may be raised or lowered. If it is raised, sugar may not appear in the urine even though the blood contains 250 or 300 mg. per cent. of sugar. The correct diagnosis can only be made by means of an estimation of the blood-sugar.

If the threshold is lowered the patient passes sugar in the urine although the blood-sugar lies within the normal limits. If it is only slightly lowered, say to 150 mg. per cent., sugar will appear in the urine after a carbohydrate meal, and suggest that the patient has a mild form of diabetes. If the threshold is below 100 mg. per cent. sugar will be present in the urine throughout the day, and will suggest that the patient has a severe form of diabetes. The diagnosis is suggested by the absence of the usual symptoms of thirst and polyuria, but can only be made with certainty by means of a sugar-tolerance test after 50 g. of dextrose.

GEORGE GRAHAM, M.D. Camb., F.R.C.P. Lond.,
Assistant Physician, St. Bartholomew's Hospital.

DONATIONS AND BEQUESTS.—Mr. James Mills Travis, Springhead, Saddleworth, Yorks, left £1000 to the Oldham Royal Infirmary for a bed.—Miners and other workmen in the Wigan district contributed £16,515 last year to Wigan Infirmary in voluntary weekly levies.—Mr. John Davison Bland, J.P., of Kippax Park, Yorks, and Torquay, left, besides other bequests, £4000 to the Leeds General Infirmary, £2000 to the Leeds Public Dispensary, £1000 each to the Leeds Women's and Children's Hospital, Leeds Maternity Hospital, St. Anne's Home, Bridlington, and the Queen's Hospital for Children, Hackney, London.—Miss Henrietta Fell, of Westbourne-grove, Scarborough, besides other bequests, left £1000 to Scarborough Hospital and the residue of her property, about £30,000, to the Birkenhead Hospital.—Mr. Isaac Dymmock, of Redland, Bristol, left £1500 to Bristol Royal Infirmary to endow a bed to be called the "Isaac Dymmock bed."—Mr. and Mrs. Joseph Smith, of Holmfield-road, Leicester, have given £500 to the Leicester Royal Infirmary for the endowment of a bed to mark the celebration of their golden wedding.—Mr. John O'Connor, K.C., of Frognal-mansions, Hampstead, London, N.W., besides other bequests, left £2000 to the Cancer Hospital, Fulham, "in grateful remembrance of services once rendered to a dear relation."—Mr. Joseph Batty, Whitchurch, left £1000 to the Cardiff Infirmary and to King Edward VII. Memorial.—Mr. Charles Stones Gray, of Rozel, Ryde, retired dental surgeon, left £1000 to St. Dunstan's Hostel, £300 to George Muller's Orphanage, Bristol, and £200 to Dr. Barnardo's Homes.—Mr. Walter Samuel Baines, Folkestone, Kent, on the decease of his wife, left £5000 to the Sutton (Surrey) Hospital, and after further bequests the balance to Dr. Barnardo's Homes, whom failing to King Edward's Hospital Fund.—Mr. Arthur Henry Foster, Green-lane, Moseley, Birmingham, solicitor, amongst other bequests, left £1000 each to the Birmingham General Hospital, the Queen's Hospital, Birmingham, the Birmingham and the Midland Homœopathic Hospital; £200 each to the Birmingham and Midland Ear and Throat Hospital, the Birmingham Royal Institution for the Blind, and the Birmingham General Dispensary; and a sum sufficient to endow a bed or cot to the Children's Hospital, Birmingham.—Subject to certain annuities, Mr. Haywood Smith, of Penwellyn, Sidcup, who left £47,259, bequeathed the whole of his estate to the Sidcup Cottage Hospital and the Chislehurst, Orpington, and Cray Valley Hospital.—Mr. Charles Courtenay Cowlin, of Somerset, left, among other bequests, £1000 to the Bristol General Hospital.

Special Articles.

THE STUDY OF INDUSTRIAL HYGIENE.

By M. GREENWOOD, D.Sc., F.R.S., F.R.C.P. Lond.,

PROFESSOR OF EPIDEMIOLOGY AND VITAL STATISTICS IN THE UNIVERSITY OF LONDON (LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE).

EVERYONE knows that, since the war, the study of industrial hygiene and medicine has entered upon a new phase. Before 1918 research was largely a by-product of the official duties of civil servants or done in the leisure of busy physicians and surgeons; since 1918, not only have many trained investigators specialised in industrial-medical research, but the appointment of whole-time medical officers by employers of labour is no longer very exceptional. Contemporaneously with this increase of skilled observers—in part, of course, its cause—has been a growth of demand for information from all classes; various national and international organisations seek to supply this demand and, as will appear later, the quality of the supply varies. Comparing what we have learned in the last ten years with what was known before, anybody not familiar with the history of scientific progress is likely to be disappointed. He *must* feel this, if his criterion be the number of practically important discoveries made, for these have been few and unspectacular.

Those really familiar with the methods of science will not, however, be discouraged. They will be satisfied if it can be shown that the *methods* of research now coming into use are more powerful than those of a generation ago and will not expect a few years' use of even powerful new methods to yield results more valuable than that which the patient observation of such men—to cite only our countrymen—as Thackrah, Greenhow, Whitelegge, Oliver, Legge, and Collis has furnished in a century. The work of the last ten years has been primarily important in methodology and—as *always* happens when we enter upon a fruitful line of research—we have learned that apparently unrelated problems, each seemingly capable of solution by an ad hoc method, are really interrelated. Serious investigators have become more conscious of their own ignorance and less willing to lay down general laws. The history of almost any of the researches of the Industrial Fatigue Research Board illustrates this. I choose, as an example, one in which I have had a small personal share—viz., the study of the ætiology and prevention of industrial accidents. The long and, on the whole, creditable history of measures taken to reduce the risk to life and limb in factories in this country is well known. It is equally well known that of the accidents now occurring only a small proportion could be prevented by action beyond the control of the worker. It has been authoritatively stated that "however well machinery is guarded we cannot look for more than 10 per cent. reduction in the accident rate by the provision of safeguards alone."[1] In other words, the greatest proportion of industrial accidents is due to factors other than those which can be eliminated by administrative or mechanical betterment.

This leads us to look at the problem from another angle. Let us suppose that we have a record of this kind: A number of people all doing the same work under the same environment have been observed for the same time, and we are told that so many had no accidents, so many had one accident, so many two accidents, &c. Can we from the *form* of this distribution learn anything about the causation of the accidents? We can put our imagination to work, invent explanations and then test them. There are three hypotheses which have occurred to most people. The first is that accidents really are a matter of luck, in which the quality of the victim goes for nothing. The case is supposed to be like that of tossing true coins; whether a coin shall fall head or tail depends upon a great many factors which, however, do not favour any one coin more than any other. The second obvious hypothesis is that, although before any accident has happened those exposed to risk are all alike, the having an accident differentiates the group so that those who have had one accident are more—*or* less—likely to have a second accident than those who have had none are likely to have a first accident. The third hypothesis is that, *ab initio*, the liability to accident varies from person to person. Each hypothesis must have occurred to any intelligent person. A step forward was taken when it was found that each hypothesis could be expressed algebraically and that the algebraical forms led to an arithmetical criterion of the probabilities of the several hypotheses. Mr. Udny Yule and I reached an approximate solution of this problem in 1919,[2 3] and our work has since been greatly improved and generalised by Miss E. M. Newbold,[4] whose admirable memoir was recently awarded the Guy Medal of the Royal Statistical Society.

A New Instrument of Research.

The approximate solution of the theoretical problem put into our hands a new instrument of research. The next step was to obtain adequate data for testing. This was a very difficult task and has occupied much of the time of several investigators for years.[5] Incidentally, it has led to great improvements in the keeping of accident records and has been of some little service to employers of labour in bringing to their notice the importance, in terms of efficiency, of individually trivial occurrences. So far as the original problem is concerned, it has been established that, while it is certainly not possible to draw hard-and-fast lines in ætiology, the third hypothesis—viz., that individual susceptibility is of primary importance—is the one most satisfactorily accounting for the facts. It further appeared that those peculiarly susceptible to minor accidents were also, on the whole, more prone to minor illnesses. Having reached the conclusion that proneness to accident tends to be an individual peculiarity, the next point was to ascertain whether this character were correlated with some other physiological or psychological character which could be independently measured. If so, it might be possible, *before* exposure to risk, to say who were likely to be dangers to themselves or others. Here, too, progress has been made, particularly by Farmer and Chambers.[6] They applied various physiological and psycho-physiological tests to a large number of subjects and found, in their final weighted results, a difference of 48 per cent. in the accident rate between those above and those below the averages in the tests. These researches are still in their infancy; no tests yet used have shown a sufficiently high association with the elusive quality—or group of qualities—determining accident-liability to be of much practical use in vocational selection. But the future is promising. Work on other lines, developing from the Board's investigation of telegraphists' cramp,[7] has also brought us to the conviction of the need to assess the psychological make-up of the worker, to seek to *measure* it. The accident problem has thus fallen into its place in the general scheme of seeking to measure all things, not only the lighting and heating of the factory, not only the output of the worker, but his personality. Speaking as a statistician, I should say that ten years rather close association with this work has not indeed shaken my natural faith in the value of the statistical instrument, but has convinced me that, while the statistician can nearly always be a useful critic, he can only do useful research work as one of a team, neither the master nor the servant of his colleagues. Those having expert knowledge of industrial conditions may blunder in statistical logic, those skilled in statistical methods may misapply them for lack of practical knowledge of the material used. This was quickly

realised in England, and the investigations of the Industrial Fatigue Research Board have always been coöperative. Often a special committee has been appointed, upon which clinicians, physiologists, statisticians, employers, and employed have met upon equal terms, and *always* a research report has had to run the gauntlet of criticism by the different experts mentioned. Of the value of this system in bringing about mutual understanding of methods and points of view I shall not speak; but one result I must notice for it is relevant to my theme. Intimate contact with those actually engaged, whether as employers or employed, in industry or commerce, has made us—if I may be permitted to reckon myself as an investigator—very reluctant to draw general conclusions or to lay down the law for any industry *as a whole*. A third year student can classify "cases" but a practitioner must treat *patients;* the investigator of industrial conditions discovers that even within a highly specialised craft the same verbal description covers disparate conditions. When the craft is not highly organised, this difficulty of being sure that what one has observed is really representative of the "universe of discourse" is still greater; yet it is just in these industries that knowledge is most needed.

Application to the Laundry Trade.

A good example is provided by Miss May Smith's "Studies in Laundry Trade." [8] One is dealing with a very important occupation employing a large number of people, but the conditions of employment are almost infinitely variable.

"Only one generalisation seems to be warranted with regard to the laundry trade as a whole—namely, that if a factory calls itself a laundry, then its main occupation is washing soiled linen and clothes. Nothing else can be taken for granted. The building may vary from a modern specially designed laundry with the latest machinery, ventilation appliances, rest and mess-rooms, to a converted house, shop, or stable, where all reconstruction has to be modified by the exigencies of the original building and where there is little or no room for expansion or modern requirements; between these two extremes there is every grade of adequate or inadequate building. Proprietors and managers, like the buildings, represent practically every social class and type of education and ability, and while we cannot say quite as much with regard to the workers, still in many laundries there exist side by side relics of the old washerwoman of a previous generation with the latest product of high-class factory girl. Turning to plant, the same diversity prevails; on the one hand is the firm anxiously distrustful of the effects of machinery on clothes and wishful to do as much of every process by hand as is compatible with its conditions, while on the other hand is the firm that eagerly tries every new appliance and scraps any machine that can be superseded by a better."

In these circumstances the research worker must first seek to discover whether the occupation when followed under reasonably good environmental conditions is inherently detrimental to health and fitness. Miss Smith took this course; her actual studies were made, for the most part, in reasonably well-equipped laundries, and there she was able to demonstrate large individual variations of efficiency and to show how improvement might be effected. Her measurements of atmospheric conditions covered a wider range of factory types, and in this matter—since the method, that of Dr. Leonard Hill, had been used in other industries—some comparisons were possible. It appeared that the atmospheric conditions of laundries compared unfavourably with those of some other industries—for instance, boot and shoe shops; the cooling powers were usually inadequate.

No General Conclusions Justified.

One would naturally wish to correlate these latter results with measures of sickness incidence, but for this adequate data were lacking. All Miss Smith was able to do was to obtain returns from 23 firms of time lost through three winter and three summer months. The data related to only 1144 workers, and all that can be said is that the percentage of time lost owing to illness—which varied from 1·0 to 1·8 per cent. of the total possible working hours—is certainly not greater than in occupations usually supposed to be healthy.

This research seems to me a good example of the method one should adopt in such cases. Some not unimportant discoveries have been made, means of minor improvements are suggested, and a further contribution is made to the knowledge of the general psychological factors of industrial efficiency. But neither the author in her text nor the Industrial Fatigue Research Board in their preface felt justified in generalising the results to cover the trade as a whole. I have quoted what seem to me convincing reasons in favour of this reticence. It might be added that it is not yet possible—it may never be possible—to compile uniform morbidity records having the *workplace* as the unit of classification for such an industry. Indeed, even when we have had to deal with highly organised and localised crafts, such as the textile trades, the compilation and standardisation of such records has been a costly and difficult undertaking. At present we really know nothing of current sickness rates in the laundry trade in England and Wales. One seems, therefore, forced to conclude that we do not know enough about the subject to draw *any* general conclusions, and so turns with a certain curiosity to an essay upon laundries recently issued by the International Labour Office. It might be that, at Geneva, data based upon continental experience had been assembled which had escaped the notice of the Industrial Fatigue Research Board.

A Geneva Brochure.

The International Labour Office's "brochure" on laundries forms No. 127 [9] of a series under the general title Occupation and Health, having the subtitle Encyclopædia of Hygiene, Pathology, and Social Welfare, Studied from the Point of View of Labour, Industry, and Trades. The cover records the names of an imposing list of expert collaborators, but this particular "brochure" (an article of six pages) carries the footnote: "According to an original report by Dr. L. Carozzi (I.L.O.), revised by the Correspondence Committee on Industrial Hygiene of the International Labour Office," which may perhaps mean that Dr. Carozzi, rather than the expert collaborators, should have the credit. The same footnote is attached to a "brochure" (four pages) upon Candles (Manufacture of) so that Dr. Carozzi's energies cover a wide industrial field.

The "brochure" opens quietly with some linguistic information and a warning that "there is an exceedingly wide range of method followed in this industry," while a paragraph headed "Dangers-Pathology," begins with the caution that "it is difficult to gauge accurately the effect of this industry on the health, since most of the diseases to which their occupation renders laundry workers liable are such as might equally well proceed from other causes. Certain investigations and statistical enquiries have shown health conditions in this industry to be in general satisfactory as compared with other industrial work." The syntax may be doubtful and we may regret that the investigations and statistical inquiries are not more closely specified, still this exordium hardly prepares us for the grisly catalogue which follows. It seems that the work and conditions of laundries "undoubtedly provoke and aggravate certain forms of disease." Varicose veins are easily developed, ulceration and flat-foot are common evils, while "the working of a foot-pedal, shaking and wringing linen, &c., are apt to exercise a bad effect on the genital organs." Eczemas and skin eruptions are common. Nails are loosened by "daily work in alkaline solutions," mycosis of "the external canal of the ear, due to *Aspergillus nigricans* or *flavescens*" may cause "marked irritation." Again, "affections of the upper respiratory passages are to be ascribed to steam and to the alkaline fumes present, which dry the throat, give rise to thirst, and often lead to habits of intemperance." This disquieting information is drawn from uncharted wells of truth known to Dr. Carozzi. Upon the subject of tuberculosis we

have a little more detail. We are first told of an authority who asserts that "tuberculosis is very widespread in this industry" and that "incipient forms of it are not uncommonly diagnosed and treated as anæmia."

The same authority, evidently a man of original mind whose name should have been disclosed, has actually drawn attention to "the part played by heredity and infection" and helpfully suggested that 'many of the victims are widows of consumptive husbands forced to take up the work in question in support of themselves and their families." This is interesting but perhaps a little inconclusive, and Dr. Carozzi, rightly, felt that some statistical verification would be expected—not of the particular fact about the widows of consumptives, which is clearly a stroke of individual genius, but of the general fact that tuberculosis is exceptionally prevalent amongst laundry workers. For England we are provided with a table introduced by these words: 'The following table shows the prevalence among workers in this industry of ulcers on the legs and pulmonary tuberculosis as compared with other women workers, the records being those of two infirmaries in *England*."

I reproduce the information contained in the first two lines of the table. We are told that in the first infirmary in the year 1899 (information is confined to 1899 and 1900) the "number of workers" consisted of 247 laundresses and 1171 other workers, 36 of the former and 50 of the latter had ulcerated legs, percentages of 1·5 and 4·3, 21 of the former and 63 of the latter had pulmonary tuberculosis, percentages of 8·5 and 5·3. In the next year the percentage of laundresses with ulcerated legs rose to 13·6, but that of other workers sank to 3·6.

This table and its description neatly illustrate some elementary mistakes. Dr. Carozzi either does not know that north and south of the Trent the word infirmary has a different meaning or supposes that the difference does not matter. If his infirmaries were *poor-law* infirmaries, *solvuntur tabulæ risû*. The highly selected sample of the sick cared for in parish infirmaries is not in respect of occupation, age distribution, or ailment typical of the working-class population. Even if the infirmaries were really hospitals, the select character of the hospital population would still invalidate the generalisation of the results. When it is further noted that the data are nearly 30 years old, that the age distributions are not given, and that percentages are based once upon six and three times upon seven cases, the reader will agree that this is indeed strange evidence to be circulated by an international organisation.

Dr. Carozzi cites other statistical evidence of less dubious origin and, in doing so, makes it clear that he is unfamiliar with medico-statistical methods. Thus he writes that "In the United States the mortality-rate for tuberculosis is only 16·3 per cent. for both sexes." This being a rate of mortality about equal to that of London in the year of the Great Plague, one might suspect a misprint, but the juxta position of a table of *proportional* mortality (the entries in which, if correct, would give a proportional mortality, for ages 25–65, from tuberculosis of between 16 and 17 per cent.) suggests that Dr. Carozzi does not mean *rate of mortality* at all, but *proportional mortality*. This follows also from his citation of Bezançon. According to Dr. Carozzi, Bezançon found that amongst laundry workers 26 to 30 per cent. of the general mortality was due to tuberculosis, a finding which, Dr. Carozzi supposes, warrants the statement that "the tuberculosis mortality is high." As the age distribution of the decedents is not given, it warrants no such statement. It would be a high proportion if the age constitution of those exposed to risk were that of the general population; it would be a low proportion if they consisted mainly of young women. For instance, in England and Wales in 1927, 89,987 women died between the ages of 15 and 65 years, of these 14,049, or 15·6 per cent., of tuberculosis. Between the ages of 15 and 45 years 34,845 died, 11,188, or 32·1 per cent., of tuberculosis. Proportional mortality figures have little value unless the age distribution is provided. *A fortiori*, to compare the unstandardised proportional mortality figure of a particular disease based upon one occupation with that from another occupation is wrong. Even when the age distributions are similar, the proportional mortality of a disease may increase although the rate of mortality decreases in passing from one occupational or social group to another. For instance, in the Registrar-General's evaluation of occupational mortality for 1921–23, 35 per cent. of the deaths in the age-group 25–35 in Social Class II. were attributed to phthisis; in the lowest Social Class V. 32·4 per cent. were so attributed. But the death-rate from phthisis was 161 per 100,000 living in this age-group in Social Class V., 132 per 100,000 in Social Class II. There is, of course, no inherent reason why the two indices should move together. Actually, when we confine ourselves to occupations of the same economic grading, they tend to do so, and the proportional mortality figure may, *faute de mieux*, be a useful pointer to the existence of special conditions. Even when different economic groups are compared, there is usually an increase of proportional mortality from tuberculosis as one descends the social scale and also an increase of mortality-rate. As Collis and I pointed out,[10] the proportional index is really of some value if used discreetly. As used by Dr. Carozzi it is worthless; he has not made it even faintly probable that *any* class of laundry workers suffers more from tuberculosis than the general population.

An Important Principle at Stake.

If this is the character of the sections of the "brochure" where statistical justification is attempted, it is surely needless to pillory *obiter dicta* of writers cited without any statistical justification. Indeed, the reader may well ask why I direct attention to this compilation at all. In fact these obvious defects make the article less dangerous than it might have been. With a little more literary skill and a little better staff work at Geneva, the blunders which have, I hope, amused the reader would never have reached the printer; but the "brochure" would have been as essentially unscientific as it is now. Indeed, an important principle is at stake. Anybody who has served in an official department knows how great is the temptation—often the result of pressure from without—to undertake "authoritative" expositions of scientific questions. It is not pleasant for an individual, it is still less pleasant for a department to admit that guidance cannot be given upon a subject of practical importance for lack of knowledge. But in a department charged with administrative duties, those responsible know that the scorn of journalists is easier to bear than the troubles which would be created by ill-grounded generalisations leading to a demand for action. One cannot easily picture the permanent head of a British Ministry who would give an *imprimatur* to such a report as Dr. Carozzi's. The cost of typing letters to indignant proprietors of laundries and of re-glazing windows broken in Whitehall by intemperate employees would be too heavy.

But the direct administrative responsibilities of the International Labour Office are not so harassing. Besides, few of the laundering widows of consumptives, or the victims of enteroptosis (a "prevalent" affection), cardialgia, kidney trouble, ptosis, retro- or ante-flexion of the uterus, dysmenorrhœa, hysteria, and anæmia (which are "common" effects) would be well enough, after the long and expensive journey to Geneva, to break the windows of the International Labour Office.

Hence there is a strong temptation to the staff of the International Labour Office to be voluminous and encyclopædic in their publications. But the temptation should be resisted or intelligent employers and employees will conclude that industrial hygiene as expounded by members of our profession is really only a poor kind of journalism. There are some branches

of applied medical science wherein the methods of research have been standardised for a sufficient length of time for it to be possible for an able medical official sitting in a library to prepare a useful summary of methods and results. Of very few subdivisions of industrial hygiene is this yet true; we need more careful field investigations, not compilations of *obiter dicta*.

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SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Scottish Hospitals under the New Bills.

Major Walter Elliot, Parliamentary Under Secretary of State for Scotland, along with the officials of the Department of Health, met the Voluntary Hospital Liaison Committee a few days ago. This committee, it will be remembered, was appointed some months ago on the suggestion of the Secretary of State, to act as a liaison between the department and the voluntary hospitals. The meeting examined the position under the new Bill, and considered suggestions. It was unanimously agreed by the Liaison Committee that the poor-law stigma should be removed from hospital treatment, and that, therefore, the public bodies should have the necessary powers to provide hospital treatment apart from the poor-law. It was essential, however, that full and adequate safeguards should be made to protect the voluntary system, and the attention of the meeting was mainly directed to finding a form of words to achieve this purpose. The departmental representatives and the Liaison Committee decided to draw up a form of words that would give the necessary powers while safeguarding the position of the voluntary hospitals. Another meeting was to be held shortly.

Now that the Aberdeen experiment is under way there ought to be no great difficulty in adjusting a form of words that will meet all interests. The voluntary hospitals are anxious to coöperate in every practicable way with the local authorities and the Secretary of State. The recent experience of Glasgow in connexion with pneumonia and influenzal pneumonia had made manifest to the voluntary hospital authorities how important it is to maintain a good understanding with the public bodies. This will become even more manifest when the health authority is the "predominant partner" in the management of all sickness, but particularly sickness attributed to any form of infection. The experiment made with Stobhill by the poor-law authorities of Glasgow has paved the way for the all-round coöperation of the Glasgow hospitals. A similar movement is proceeding in Edinburgh. It is generally expected that all difficulties will disappear.

The Juvenile Delinquent.

In the circulars issued by the Scottish Office for magistrates and justices regarding the reports of the Departmental Committee on the Protection and Training and on Sexual Offences against Children, prominence is given to the necessity for careful medical examination of the juvenile and the juvenile-adult delinquents. The intention is to secure that any form of mental defect shall not be treated as mere criminality. It is laid down that the medical examiner selected by the juvenile court should, if possible, be one who has special qualifications for this class of work, and it is desirable that he should have some special experience in dealing with defective children or young persons. In most cases services of school medical officers will be readily available for this purpose. It is well that this point is emphasised, because, among recent developments, the non-medical psychologist has tended to become the dominant power. But it is well known that in many forms of mental defect, the psychological condition is merely a symptom either of imperfect physical development or of the positive presence of disease in glands or other hormonic structures. When education alone is in question, the lay psychologist has a large part to play, and the majority of delinquents demand the services of both types of expert.

The Scottish Education Department has issued a special circular on the report of the Committee on Sexual Offences. Mr. McKechnie, the new Secretary of the Scottish Education Department, was himself a member of that Committee, and, as one might expect, the circular gives evidence of an intimate and comprehensive knowledge of the problems. Mr. McKechnie lays great stress on the moral health of the children, and places character building among the primary duties of the education authority. He urges the importance of establishing social contacts of every desirable kind—for example, definite Church connexion, organised play centres, and playing-fields. In particular the department's circular suggests that the names "reformatory" and "industrial" shall be dropped from the description of schools. Although this cannot at present be done without an amended legislation, the department will henceforward call these schools training schools or have them known by a distinctive name. Also, it is suggested that as far as possible the children should attend the ordinary day schools in the district. Stress is laid on the need for recreation amenities and freedom, and above all for constructive education.

In connexion with the delinquent there is one important point—that the medical and school records should be available for the use of the court and that the education authorities should be willing to furnish these. These two circulars now formally bring the treatment of the juvenile delinquent on to a better administrative plane. They deserve the closest study by everyone concerned with this difficult group of problems.

The Influenza Epidemic in Glasgow.

The outbreak of influenza in Glasgow has been relatively sudden; there was nothing in the December figures to give warning of its approach. In fact, according to Dr. MacGregor's bulletin, the death-rate of 13·1 per 1000 in that month was remarkably low for the season; last December it was 18·7. Indeed, the 1928 death-rate as a whole was low—viz., 13·7, the same as the two lowest recorded years 1922 and 1927. Nor were the December pneumonia deaths exceptional, being 197 as against 298 for 1927; the other respiratory deaths being 94 as against 152. The epidemic was not preceded by any calculably greater prevalence of such simpler respiratory affections as acute tonsillitis. Reports of cases came in rapidly during the later days of a rather dense and continuous fog, which was followed by dull and cold weather, with mist at certain parts of the day. Other parts of Scotland were affected in more or less the same way, but Glasgow fogs are usually more severe. Fog and low temperature together, coming at the same time as the influenza, have greatly increased the incidence of acute pneumonia as a complication. Unlike the serious outbreak in the first quarter of 1927, this outbreak is not characterised by any peculiar virulence of the influenza itself; the symptoms are catarrh of the

upper respiratory passages, with moderate fever, lasting from three to five days, with the usual headache, general pains, malaise, and slow convalescence. There has been a good deal of laryngitis. The increase in the death-rate is due to the acute pneumonia accompanying or following the actual attack of influenza. The influenza epidemic began in the week ending Jan. 5th, when the general death-rate was 19·15 per 1000. In the week following it rose to 31·2 and 43·2, much as in March and April of last year. The actual deaths for these three weeks were: influenza, 14, 49, 149; bronchitis, 39, 73, 114; pneumonia, 59, 118, 187; other respiratory diseases, 4, 13, 14; total deaths, 116, 253, 464. The age-incidence is striking; children under 5 have suffered most from the respiratory group (excluding influenza). Thus, while the under-5 deaths from influenza were only 1, 0, and 15 in the three weeks, the figures for pneumonia and bronchitis together were 24, 62, and 107, with only one under-5 death from other respiratory forms. It should be added that "pneumonia" probably covers lobar consolidation, congestion of the bases, bronchitis and heart disease (especially in the old), and broncho-pneumonia. Some 600 to 700 beds are in use for pneumonia and the like in the municipal hospitals and no doubt, as formerly, further beds will be made available.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The General Death-rate.

THE death-rate for the year 1927 has just been reported by the Chamber of Commerce to be 11·4 per 1000 living. This compares favourably with the rate of 12·2 for the year 1926. All but five of the 41 States in the registration area showed some fall in their rates. Those showing increases are all young States, in which the age-constitution of the population is probably not yet stable, and the first three are also the resorts of invalids. The States in question are Arizona, California, Colorado, Oregon, and Wyoming.

Deaths from Snake-bite.

During the past year 570 cases of snake-bite have been reported to the Antivenin Institute of America in Philadelphia. Of these 401 received serum, of whom 11 died. Among the remaining 169 there were 16 deaths. Copperheads were responsible for the largest number of bites, 159 being reported from 21 States between April and November. The cotton-mouth moccasin bit 38, the pygmy or ground-rattler 171, and the massasagua or swamp-rattler 2. Of the true rattlesnakes (genus Crotalus) the Texas diamond-back bit 95, the timber rattlesnake 40, the prairie rattlesnake 38, Pacific 27, Eastern diamond-back 11, and sidewinder 4.

Influenza.

The public health service estimates that there were one and a quarter million new cases of influenza in the week ended Dec. 22nd. The disease has been very general this winter, though not particularly fatal. A definite epidemic was noted on the California coast in the second half of November. It appears to have spread rather slowly, until it has now reached the Eastern sea-board. In some sections children and young adults are said to be chiefly affected, in others people of middle age. It is probable that many more cases occur than are reported and that, if all cases were known, no age-group would be found to have escaped. Surgeon-General Cumming speaks of the possibility of a second epidemic wave with higher fatality.

Prof. John J. Abel and Dr. H. Jensen, of Johns Hopkins Hospital, announce that they have isolated the active principle of insulin in the form of a crystalline protein of relatively simple composition.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Health of the People.

SOME idea of India's vast public health problems may be obtained from the report for 1926 of the Public Health Commissioner with the Government of India which has just come to hand. India's death-rate in 1926 was 2½ times that of England and Wales, her infant mortality-rate 2⅔ times. In India the expectation of life at 5 is approximately 35 years, and at 20 is about 27, as against 54 and 41 respectively in Great Britain. Generally it may be accepted that an Indian's expectation of life at birth is less than half the average figure for a European. Cholera was responsible for 59,000 deaths in Bengal alone. During the year 196,000 deaths from plague were recorded in British India; of these no fewer than 108,000 occurred in the Punjab and 57,000 in the United Provinces. In 1926 the infant mortality-rate per 1000 births for British India was 189, while in several towns approximately half the infants born died within the first year of life.

The medical inspection of school-children is in a very backward state, but such figures as are available indicate that the physical fitness of this class of the population is very unsatisfactory. In the administration report of the School Committee of the Bombay Municipality for 1926–27 some significant figures are given. There were 25,332 children inspected, of whom 18,786 were boys and 6546 girls. Of these 17,059 were examined for the first time and 8273 were re-examined as they had been found diseased in the previous year's inspection. Of those examined for the first time only 40 per cent. of the boys and 34 per cent. of the girls were found to be free from disease or defect. In other words, 60 per cent. of boys and 66 per cent. of girls were medically wanting. Malnutrition was the most prevalent condition (27·8 per cent. of boys and 32·2 per cent. of girls). Defective teeth were found in 26 per cent. and 27·5 per cent. respectively, and other common defects were those of the throat, nose, and eye, enlarged spleen (9 per cent.), enlargement of lymph glands, contagious skin diseases, and lung diseases.

Medical Research in India.

The annual Conference of Research Workers, held recently at the School of Tropical Medicine and Hygiene, Calcutta, under the presidency of Major-General T. H. Symons, Director-General of the Indian Medical Service, was attended by delegates from various parts of India representing different aspects of medical research, public health, and allied interests, to the number of about 50. Two schemes at present under consideration by the Government of India were discussed. One of these concerns the proposed establishment of an All-India Institute for Education and Research in Public Health, towards which the Rockefeller Foundation in America is offering assistance. This institute will be built close to the present Calcutta Tropical School, with which it would be associated. The second scheme is the result of the report of the Fletcher Committee, which suggested the establishment of a Central Institute of Medical Research at Dehra Dun. The influence of these two schemes on the activities of the Indian Research Fund Association was closely scrutinised. The researches carried on by the association during the past year were reviewed, and it was found necessary to stop a few of the inquiries and to limit activity of others on account of shortage of available funds. This still leaves a comprehensive programme of research into most of the principal diseases of India. The secretarial duties of the Conference were in the hands of Lieut.-Colonel F. P. Mackie, I.M.S., officiating Public Health Commissioner with the Government of India.

Tuberculosis in Bengal.

The grave menace to public health caused by tuberculosis in Bengal is brought out in a recent lecture by the Director of Public Health in that province. There is evidence that tuberculosis is exceedingly widespread in Bengal, not only in the towns but also in the rural areas. Investigations suggest that something approaching 10 per cent. of the total mortality in several districts is due to phthisis, and there are grounds for believing also that this is by no means an excessive estimate. In the case of Calcutta about 8 per cent. of all deaths are ascribed to tuberculosis, but Sir Leonard Rogers, as a result of a careful examination of the records of post-mortem examinations made in connexion with the Calcutta hospitals during the past 22 years, has shown that no less than 17 per cent. of the total deaths were due to tuberculous disease, and that in 25 per cent. of cases examined signs of tuberculosis were present.

Public Health Services.

INFLUENZA.

THE weekly returns of deaths attributed to influenza in England and Wales, of which a summary follows, do not show any increase abnormal for the time of year. In Scotland the deaths from influenza in the week ended Jan. 19th numbered 179, being 123 more than in the previous week. Of these 179 deaths, 151 occurred in Glasgow, about which our Scottish correspondent gives some details. In Northern Ireland an unusual number of deaths from influenza are reported in Belfast, where the prevalence of the disease has been manifest among the constabulary and in the transport service. Our Dublin correspondent writes that there is as yet apparently only one serious outbreak of influenza in the Irish Free State—namely, in Waterford. The Department of Local Government and Public Health has, however, acted wisely in issuing a circular to all sanitary authorities detailing the precautions to be taken against the spread of the infection. An educational leaflet has also been issued which relates the modes by which infection is spread, and advises the avoidance of all overcrowded houses of amusement and overcrowded public conveyances. Advice is given to those attacked to retire to bed at once and seek the aid of a doctor, and also to avoid any undue exertion for a considerable time after the attack. In the circular to sanitary authorities it is suggested that children from infected houses should not attend school, and in cases of epidemics in rural areas the schools might be closed. Patients suffering from influenza should be isolated early, and if a patient is nursed at home he should have a separate room. The danger of spitting is emphasised. Those suffering from influenza or catarrh should realise that they may convey infection to others with fatal results. The notification of pneumonia and influenza-pneumonia has been rendered obligatory by an order of the Department.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 12TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 213 (last week 188); scarlet fever, 2221; diphtheria, 1245; enteric fever, 28; pneumonia, 1936; puerperal fever, 37; puerperal pyrexia, 120; cerebro-spinal fever, 9; acute poliomyelitis, 4; acute polio-encephalits, 1; encephalitis lethargica, 19; dysentery, 5; ophthalmia neonatorum, 81. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 17 counties: London, 6; Bedford, 1; Chester, 2 (Ellesmere Port); Derby, 31; Durham, 45; Essex, 8 (West Ham); Lancaster, 13; Leicester, 13 (County Borough); Northampton, 10 (County Borough, 9); Northumberland, 16 (Tynemouth); Nottingham, 1 (Worksop R.D.); Soke of Peterborough, 8; Stafford, 1 (Stoke-on-Trent); Wilts, 1 (Swindon); Yorks, West Riding, 33; Glamorgan, 15 (of these Merthyr Tydfil 10), Monmouth, 9.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Jan. 15th-16th was as follows: Small-pox, 32 under treatment, 1 under observation; scarlet fever, 1984; diphtheria, 2153; enteric fever, 19; measles, 45; whooping-cough, 608; puerperal fever, 26 (plus 10 babies); encephalitis lethargica, 75; poliomyelitis, 4; "other diseases," 32. At St. Margaret's Hospital there were 19 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was 1 death from small-pox, 2 (0) from enteric fever, 28 (0) from measles, 8 (2) from scarlet fever, 59 (13) from whooping-cough, 50 (10) from diphtheria, 58 (15) from diarrhœa and enteritis under two years, and 122 (24) from influenza. The figures in parentheses are those for London itself.

The number of deaths from influenza during the previous seven weeks were 49, 56, 60, 61, 69, 83, and 99 respectively—a slow and even rise. The deaths in the week under review occurred largely in the midland and northern counties: Brimingham 6, Liverpool 5, Leeds 4. Glasgow reported 50 and Belfast 7, during the same week. The two deaths from enteric fever outside London occurred at Leyton and Newcastle-on-Tyne. Liverpool reported 7 deaths from measles, Hull and Sunderland 3 each. Leeds reported 4 deaths from whooping-cough, Salford, Oldham and Burnley 3 each (Glasgow 7). Five deaths from diphtheria occurred in Plymouth, 4 in East Ham, and 3 in Nottingham. Manchester reported 6 deaths from diarrhœa, Liverpool 5, and Salford 4. One death, provisionally classified to small-pox, was assigned to Halifax C.B.

The number of stillbirths registered during the week was 249 (corresponding to a rate of 36 per 1000 births), including 45 in London.

SOCIETY OF BRITISH NEUROLOGICAL SURGEONS.

THE fifth meeting of this Society was held in London in December under the presidency of Sir Percy Sargent. A visit was paid to Guy's Hospital, where Mr. Lancelot Bromley operated, turning an osteoplastic flap by de Martel's method. The Society was addressed by Dr. A. F. Hurst on the Cause of Trophic Disturbances in Nerve Injuries, and Dr. C. P. Symonds showed cases including radiograms of a calcified angioma of the brain, to which Mr. Bathe Rawling was able to exhibit a parallel. Dr. Symonds further exhibited a case illustrating tonic innervation of the hand in a young woman clinically diagnosed as a congenital aneurysm, and a case of cervical rib with cerebral embolism. The relationship between vessel compression and embolism was discussed. Mr. Bromley presented a female patient from whom he had enucleated a spinal tumour. Persistent contractures of the hamstrings had necessitated tenotomies, so successfully carried out by Mr. W. H. Trethowan that the patient was now able to walk up and down stairs. The meeting was resumed in the afternoon at the National Hospital, Queen-square, where Sir Percy Sargent opened a discussion on the Radium Treatment of Cerebral Tumours, and Mr. J. P. Ross described the technique and results so far obtained in a small group operated upon at St. Bartholomew's Hospital. This subject, theoretically so full of promise for the glioma patient, was fully discussed by other members. Dr. J. G. Greenfield's paper on the Hæmangiomatous Cysts of the Cerebellum (Lindau's tumour) preceded this, illustrated by a series of cases in which the pathology of the condition was built up step by step. Other papers read were: Prof. Archibald Young's on Chordoma, Mr. Julian Taylor's advocating a more posterior approach than the classical London route to the root of the Gasserian ganglion, Mr. A. A. McConnell's on Mistakes in the Interpretation of Ventriculograms, and Mr. Lambert Rogers's on Elephantiasis Neurofibromatosa. The Society's dinner was held at the Langham Hotel with Mr. Donald Armour in the chair. On the following morning Mr. L. R. Broster divided the sensory root of the trigeminal nerve for neuralgia and showed a number of patients, including a young woman with a suprarenal tumour and virility (the second example of this unusual condition which he has placed before the Society). Dr. W. J. Adie read a brief paper describing cases of spinal and pituitary tumours and emphasised the importance of being on the watch for these latter in cases of non-syphilitic optic atrophy. Dr. A. B. Rosher contributed a talk on the chemistry and cytology of cerebro-spinal fluid, whilst Dr. G. Viner discussed the histology of the gliomas and showed a number of specimens.

Correspondence.

"Audi alteram partem."

ASTHMA RESEARCH.

To the Editor of THE LANCET.

SIR,—Perhaps Mr. Frank Coke will forgive me if I take his letter in your issue of Jan. 19th as a text from which to plead for the serious consideration of the psychological aspect of asthma. He writes: "In the past those unfortunate people, the asthmatics, have been treated as neurotics, and their symptoms stigmatised as nervous manifestations, and they were told they were incurable." It is news to me that such a state of affairs once existed, but the phrases "treated as neurotics" and "stigmatised as nervous manifestations," suggest that he refers to an era before the development of modern psychopathology. He justifiably holds out hope of cure from the study of biochemical processes and his list of methods of cure—so divergent that it is difficult to conceive a theory of pathology common to all—is far from complete. From my own knowledge I can add cauterising the nasal septum, avoiding feather pillows, Christian Science, psychotherapy, and a visit to the battlefields of France—vagaries sufficient to suggest some factor not to be elucidated by research limited to biochemical phenomena.

Psychopathologists have of necessity received sufficient training to follow the work of Mr. Coke and his colleagues with reasonably intelligent interest. They have, in addition, the advantage of practical experience of the influence of mental processes, often unsuspected by the ordinary clinician, in producing emotional states which, in turn, find expression by alterations of physiological function. Some of them have recorded cases of asthma in which the sequence of pathological events was of this nature and, in spite of Mr. Coke's pessimism, they even hold out hopes of cure by psychological means. I myself am acquainted with people who actually claim to have been cured of asthma by some kind of psychoanalysis. Yet psychopathologists find no difficulty in reconciling their views with biochemical theory; some theory of the kind is necessary, for by their own hypothesis a physiological process is set in motion, and it must follow a biochemical path. They will even admit that to direct our therapy towards the physiological process is often justified by results.

We must accept as facts of observation both the biochemical phenomena and the disappearance of asthma after psychological treatment, treatment which is not haphazard but which often throws light upon the *why* of the situations that have called up the attack, and it is probable that the correlation of these two groups of facts may furnish the key to the whole problem. Instead of a collection of abnormalities to be interpreted only as freakish manifestations of a biochemical Puck, we have now a reasonable assumption of cause and effect that may be made a basis of research. As a point of attack we might start on the relation between hysterical dermatographia—a physiological sign of pathological anxiety—and the urticaria group or the dermal reactions of the asthmatic, not omitting a psychological study of the sufferers.

Those who regard an asthma patient as something more than a collection of test-tube reactions and conditioned reflexes will, in the interests of coöperation and understanding, protest against the point of view implicit in Mr. Coke's words as quoted above. I may be doing him an injustice, but I read into them that he uses "neurotic" as a term of reproach and regards any psychological approach to a disorder as an attack upon the moral integrity of the sufferer. This mental attitude still survives, and we often read in case reports such phrases as "the patient was in no way neurotic," the only information given by the phraseology being that the reporter does not appreciate possibilities. Would he recognise (or stigmatise) as "neurotic" the hardworking and overscrupulous type described in the leading article in the same issue? This protest concerns the nervous patient generally. With regard to the main question, it is not too much to say that any worker upon asthma who pushes aside the help offered by psychopathology deprives himself of an essential weapon.

I am, Sir, yours faithfully,

MILLAIS CULPIN.

Queen Anne-street, W. Jan. 21st, 1929.

THE TREATMENT OF HÆMORRHOIDS BY INJECTION.

To the Editor of THE LANCET.

SIR,—I note with surprise the renewed advocacy of the submucous injection treatment of hæmorrhoids. I recall a joint meeting [1] of the American Proctological Society and the corresponding subsection of the Royal Society of Medicine, held in London on July 9th, 1924, when, following a very able paper by the late Mr. Græme Anderson, and after a full discussion, the general opinion was that the method was only of use in simple uncomplicated cases, and that recurrence followed in some 50 per cent. of these. How is it possible for such a method to deal with those cases, very common, in which there is a large protruding œdematous mass of rectal tissue, showing bleeding ulcerative piles higher up? I feel certain that if Mr. Christopher Howard and Mr. A. S. Morley will try the treatment by galvanopuncture into the vein itself, described by me before the Harveian Society in October, 1925, and afterwards published,[2] they will never use any other method. I am, Sir, yours faithfully.

Harley-street, W., Jan. 21st, 1929. W. S. WHITCOMBE.

MYOFIBROSITIS.

To the Editor of THE LANCET.

SIR,—In his address on Myofibrositis as a Simulator of Other Maladies, published in your issue of Jan. 19th, Prof. G. R. Murray is highly interesting and informative, but he does not give any evidence of the symptoms mentioned being caused by fibrositis. However tempted one may be to agree with him—and it would be impossible to prove that they were not so caused—Prof. Murray's readers would be grateful for definite evidence of fibrositis being the fiend that causes all this trouble. Positive evidence is much more satisfactory than reasoning by exclusion.

I am, Sir, yours faithfully,

SHEFFIELD NEAVE.

Ingatestone, Essex., Jan. 21st, 1929.

TEACHING OF MEDICAL HYDROLOGY.

To the Editor of THE LANCET.

SIR,—Owing to the proposal to make spa treatment available for insured patients suffering from rheumatism and kindred ailments, it is probable that many medical men in this country would be glad of the opportunity of learning something of a method of treatment which is more familiar to the medical profession on the Continent than in Great Britain. Until quite recently the only means of obtaining information on these subjects was to visit one of the spa hospitals, but in 1923 a Committee was formed, composed of representatives of the chief spas of Great Britain, and from London, for the purpose of giving instruction in medical hydrology in the universities and medical schools of Great Britain. This function the Committee still performs, but it is thought that some medical societies not connected with teaching centres might care to hear lectures

[1] See THE LANCET, 1924, ii., 117.
[2] Brit. Med. Jour., 1925, ii., 992.

on this subject. The Committee has selected as lecturers a number of medical men who have expert knowledge of the subject, and I shall be glad to forward a list of their names to the secretary of any medical society who may wish for further particulars.

I am, Sir, yours faithfully,

GEOFFREY HOLMES, M.B. Camb.,
Honorary Secretary,
The Committee for the Study of Medical Hydrology in Great Britain.

11, Ripon-road, Harrogate, Jan. 15th, 1929.

THE CAUSE OF SEA-SICKNESS.

To the Editor of THE LANCET.

SIR,—A good deal of controversy has raged in the medical press and elsewhere on the pros and cons of ocular sensation as a cause of sea-sickness. The following personal experience may have some bearing on the matter.

As a sailor I have experienced the sensations of sea-sickness sufficiently often to recognise them without any doubt or question, though fortunately, provided there is an adequate supply of food available to fill the gaps as created, I have not suffered severe incapacity. I have noticed similar sensations when trying to read in a corner seat with my back to the engine in a train, but I have never known any similar sensation in any shape or form while in a motor-car until Sunday last. On this occasion, I drove from Hammersmith Broadway to Roehampton through a dense white fog, which was drifting steadily almost at right angles across the road in front of us; and, after some half hour or so of groping along, the all-too-familiar sensations returned with sufficient severity to render it almost impossible to keep my seat, although I did manage to survive with a considerable effort.

In a still fog, such as one usually encounters in London, I have never known a similar sensation to the smallest extent, and can only conclude that in my own case at any rate ocular sensations must play a very large part in the production of the symptoms.

I am, Sir, yours faithfully,

Jan. 22nd, 1929. M.A., M.D.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

REASSEMBLY OF PARLIAMENT.

BOTH Houses of Parliament reassembled after the Christmas recess on Tuesday, Jan. 22nd.

HOUSE OF COMMONS.

TUESDAY, JAN. 22ND.

Report on Milk Prices.

Mr. ROBERT MORRISON asked the President of the Board of Trade whether the Food Council had now completed its report upon milk prices; and when it would be published.—Sir P. CUNLIFFE-LISTER replied: I understand that the preparation of the report has reached an advanced stage, but I cannot give a definite date for its publication.

Slum Clearances in Glasgow.

Mr. STEPHEN asked the Secretary of State for Scotland the total number of houses built in Glasgow last year under the slum clearance scheme and the corresponding figure for the previous year; and how many slum houses it was estimated remain to be dealt with.—Sir J. GILMOUR replied: The total number of houses completed in Glasgow under slum clearance schemes was 996 in 1926 and 838 in 1927. I am informed that the estimated number of slum houses in the city remaining to be dealt with is 13,000.

Slum Clearance Schemes.

Lieut.-Commander KENWORTHY asked the Minister of Health how many houses had been demolished under slum clearance schemes in the last four years; and how many persons formerly living under slum conditions had been re-housed under these schemes.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: Information in regard to the matter referred to by the hon. and gallant Member is only available from April 1st, 1925. Between that date and Dec. 31st, 1928, the latest date for which particulars have been furnished, 8540 buildings have been acquired for demolition, 6002 buildings have been demolished, and 6949 new dwellings have been erected in connexion with slum clearance schemes. It is estimated that approximately 31,000 persons have been re-housed in these new dwellings.

Lieut.-Commander KENWORTHY asked if there was any prospect of these meagre operations being expedited.

Sir KINGSLEY WOOD replied that considerable progress had been made during the last few years, as local authorities were displaying more vigour in dealing with slum clearance schemes.

Obituary.

FERNAND WIDAL, M.D. PARIS,

PROFESSEUR AGRÉGÉ DE LA FACULTÉ DE MÉDECINE.

WE regret to announce the death from cerebral hæmorrhage on Jan. 14th at his *appartement* in Paris of Prof. Widal, whose name is everywhere familiar in connexion with the agglutination reaction.

Georges Fernand Isidore Widal was born on March 9th, 1862, at Dellys in Algiers, a small town, few of whose inhabitants are European, situated a mile or two east of Algiers on the coast. He received his medical education in Paris, and by his attainments and his application made a mark among his fellows in early life. He was an interne des hôpitaux in 1885, took his doctorate in 1889, and he was but 27 years of age when he published his treatise on Puerperal Infection, a work which showed that he possessed already a valuable power of bringing laboratory experience directly to the bedside. He became professeur agrégé in 1895, and in the following year he obtained world-wide fame by the so-called Widal test for the diagnosis of typhoid fever. The association of his name alone, however, with this test was an error. The discovery of the agglutinating action of typhoid serum and its application to the clinical diagnosis of typhoid fever occurred in 1896, and was the work of H. E. Durham, Max Gruber of Vienna, and Widal. A good deal of acrimonious discussion has taken place with regard to the respective merits of these workers, but there is little doubt now that the pioneer was Gruber. The first actual publication, with admitted acknowledgments to Gruber, was made by H. E. Durham. This was in January, 1896, and it was followed by two communications from Gruber and Durham in March of the same year. In Durham's first paper on the subject attention was directed to the possibilities of the agglutination method for the clinical diagnosis of typhoid fever, and this phenomenon was demonstrated by Widal on June 26th, 1896. Early in September A. S. Grünbaum (afterwards Leyton) published in THE LANCET (1896, ii., 806) a Preliminary Note on the Use of the Agglutinative Reaction of Human Serum for the Diagnosis of Enteric Fever, in the course of which he referred to Widal's work in terms which the French pathologist resented. Widal's own description of the significance of his researches followed in THE LANCET in November of the same year when he claimed his position as the author of the new method—viz., that of "serum diagnosis by which typhoid fever can be recognised almost

FERNAND WIDAL.

instantaneously by simply observing microscopically how the serum of a patient acted on a culture of Eberth's bacillus." The question of priority was thus challenged, but it is now seen to be of little significance and its phenomena are usually now termed simply the agglutination reaction.

Following on the developments in the diagnosis and prevention of typhoid fever, especially in sequence to discoveries in respect of typhoid vaccination, Widal achieved a reputation for original research which perhaps he hardly merited. He became one of the best-known medical men in Paris, being especially a prophet of the idea that science should be applied in practice, a doctrine which drew to him a very large following of young men, and which can hardly be called novel. But his clinical fame was truly earned, and will largely rest on his hospital work at the Cochin Hospital, where his classes were admirably organised and where his brief lectures invariably attracted large crowds. His laboratory work in the later phases of his career was of a desultory character; he showed extreme keenness in many directions, but can hardly be credited with any ordered researches. None the less he certainly enjoyed and deserved his great position as a physician, and his qualities as a man of the world stood him in excellent stead with the public.

Prof. Widal had been confined to bed for a week with an acute attack of gout when cerebral hæmorrhage proved rapidly fatal. He was buried at the cemetery of Montmartre on Jan. 17th, when the funeral address was delivered by Prof. Lemmière.

THOMAS BROOK, B.D., M.D., LL.D. Dub., who died at Biskra in Algeria on Jan. 7th, was a graduate of Trinity College, Dublin, in arts, divinity, medicine, and law. He was ordained in 1895 and after holding a curacy in Derbyshire and another in London returned to Dublin as acting chaplain to the Forces. This gave him the chance of studying law, and when next he returned to Dublin, after a period as Army chaplain at Malta, he graduated in medicine also. During the late war he served in France and Salonika, and on retirement from the Service in 1919 he was attached to the staff of the Ministry of Pensions for some time, later acting as medical officer to the Brigade of Guards at Pirbright. He had gone to Biskra for the benefit of his health, and died at the age of 58.

BY the death of ARTHUR HENRY HEADLEY HUCKLE, M.R.C.S., L.D.S., on Jan. 13th, Hastings loses a practitioner of high standing in the neighbourhood. An Australian by birth, he was born at Melbourne in 1871, and was a son of the late Frederick Thomas Huckle. He came to England as a child and was educated at Dulwich College and University College, London. He studied medicine at Guy's Hospital, and after taking both dental and medical diplomas was also called to the Bar. In 1904 he was appointed medical superintendent of the Hastings Borough Sanatoria, and in 1901 he joined the staff of the Royal East Sussex Hospital as honorary pathologist and dermatologist. Of late years he was medical officer of the Hastings and East Sussex venereal diseases clinic. Dr. Huckle married Grace, only daughter of the late Dr. Walter Farnfield, and his widow is left with one daughter.

HERBERT NORMAN EVANS, B.M. Oxf., who died at Seaford on Jan. 9th in his ninety-fourth year, was the eldest son of Dr. Herbert Norman Evans, of Hampstead, and was educated at Winchester and Exeter College, Oxford. Like his father and his grandfather before him, he adopted medicine as a profession, and after studying at St. Bartholomew's Hospital became M.R.C.S. Eng. in 1860. From 1864 until 1893 he practised in Hampstead, being appointed surgeon to the Hampstead Dispensary. On retirement he went to live at Seaford, and enjoyed remarkably good health until quite recently. Dr. Evans had been a good rifle shot, and joined the Volunteers in August, 1859, when the movement was started. He served for 33 years as a private in the 3rd Middlesex Regiment, his professional work preventing him from giving up more time. He was twice married and leaves four children.

THE death has occurred at Oswestry of ROBERT DE LA POER BERESFORD, M.D. Glasg., at the age of 86. Educated at Trinity College, Dublin, he also studied medicine at the University of Glasgow, where he graduated M.D. in 1871, having previously qualified L.R.C.P. & S. Edin. in 1869. In 1916 he took the D.P.H. of Liverpool University. Dr. Beresford went to Oswestry more than 60 years ago and for 59 years was medical officer for the town. He was a justice of the peace for Shropshire and mayor of Oswestry for two years.

JOHN HARRISON, M.R.C.S., who died at Braintree on Jan. 16th, qualified in 1882 after studying at Guy's Hospital, and was appointed coroner for North Essex over 44 years ago. During his term of office he held over 5000 inquests. Dr. Harrison was 72 years of age and was educated at Felsted School, where he was afterwards medical officer.

THE death took place on Jan. 14th, in his eighty-first year, at his home in Sheffield, of ALGERNON ARCHIBALD PAYNE, M.R.C.S., who was the oldest medical practitioner in the city. He qualified in 1877 after studying at Sheffield and St. Bartholomew's Hospital, and was in practice in Sheffield for over half a century. He was an authority on war medals and decorations and on British and foreign Orders, and in 1911 he published a book on this subject. He also wrote a history of the York and Lancaster Regiment.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on Jan. 18th the following degrees were conferred:—

M.B. and B.Chir.—S. W. Savage and Fred Smith.

B.Chir.—Leslie Foulds, Edward Clayton-Jones, A. J. Dix Perkin, H. F. Bateman, L. T. Hilliard, and J. C. F. Lloyd-Williamson.

ROYAL INSTITUTION.—On Tuesday, Jan. 29th, at 5.15 P.M., Prof. J. S. Huxley begins a course of six lectures on Evolution and the Problem of Species, and on Thursday, Jan. 31st, Sir William Bragg gives the first of three lectures on the Early History of X Rays.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—A post-graduate course in orthopædic surgery will be held at this hospital from March 11th to 23rd, with lectures and demonstrations daily. Further particulars may be had from the Secretary of the hospital, 234, Great Portland-street, London, W. 1, or from the Fellowship of Medicine.

ROYAL LONDON OPHTHALMIC HOSPITAL. — The annual dinner of past and present students of this hospital will be held at the Langham Hotel, Portland-place, London, W., on Thursday, Feb. 7th, at 7 for 7.30 o'clock. Mr. Charles Howard Usher will preside, and applications for tickets should be addressed to Sir William Lister, 24, Devonshire-place, W. 1.

HOSPITAL ASSESSMENTS.—Considerable increases have been made in the valuation of hospitals in the area of the North Middlesex Assessment Committee: the Prince of Wales's Hospital, Tottenham, has been raised from £335 to £1650; Hornsey Central from £20 to £440; Wood Green from £15 to £300; Enfield from £12 to £372.

ST. BARTHOLOMEW'S NURSES.—Last week the Lord Mayor of London declared open the new recreation rooms of Queen Mary's Home for the St. Bartholomew's Nurses. There are separate sitting-rooms for nurses and probationers, a lecture-room, a class-room, and the Isla Stewart Memorial Library. Two blocks of the home are already in use, and it is hoped that the southern extension will be ready for occupation late in the present year.

LIVERPOOL JEWISH HOSPITAL.—A house in Alexandra-road, Aigburth, has been purchased for conversion into a Jewish hospital. The building has passed the scrutiny of a committee of 20 medical men.

A "SILVER PAPER" COT.—Viscountess Craigavon, wife of the Prime Minister of Northern Ireland, last week gave this name to a cot in the Ulster Hospital for Children and Women, Belfast. It has been endowed with money derived from the sale of "silver paper."

A SCOTTISH FEVER AND TUBERCULOSIS HOSPITAL.—Major Walter Elliot, M.P., recently opened a new fever and tuberculous hospital at Wester Moffat, Airdrie. The work has cost £36,000.

NAVAL MEDICAL COMPASSIONATE FUND.—At a quarterly meeting of the directors of the Fund, held on Jan. 22nd, Surgeon Vice-Admiral Arthur Gaskell, Medical Director-General of the Navy in the chair, the sum of £100 was distributed among the several applicants.

GLASGOW STUDENTS' COLLECTIONS FOR CHARITIES. The students of Glasgow University on Jan. 19th collected over £15,000 for local charities, and several contributions have still to be added. It is expected that this year's collection will be little short of that of last year's, which amounted to £16,500. In nine years the Glasgow students have raised nearly £100,000 for local charities.

LONDON, MIDLAND, AND SCOTTISH RAILWAY HOSPITAL FUND.—The total receipts of this fund last year were £145,000, of which £40,000 was contributed by the Company and £105,000 by the men. Hospitals received £90,000 and convalescent homes £20,000 ; dental treatment and surgical and optical appliances absorbed £25,000.

RADIUM IN SWEDEN.—Six grammes of radium sulphate, purchased at a cost of £63,000, is the first result of the national gift of the Swedish people to King Gustaf V. on the occasion of his seventieth birthday last year. According to the special wish of the King, this gift fund, which now amounts to more than £280,000, will be used entirely for fighting cancer.

ULSTER MEDICAL SOCIETY.—At a meeting of this Society on Jan. 10th the President, Prof. T. H. Milroy, moved, and Dr. J. S. Morrow seconded, a resolution recording appreciation of the valuable services rendered to the Society by the late Dr. W. L. Storey, who for 35 years took an active interest in all its affairs.—Dr. S. B. Boyd Campbell read a paper on the Treatment of the Sequelæ of Encephalitis Lethargica by Malaria, demonstrating a number of cases to the meeting, and reviewing a series of 50 cases in which this method had been tried. Dr. J. S. Morrow, Dr. A. Gardner Robb, Sir Thomas Houston, Dr. F. Coates, Dr. J. C. Young, Dr. N. B. Graham, Dr. W. Burns, Mr. J. O'Doherty, and the President joined in the discussion which followed.

TORBAY HOSPITAL CONTRIBUTORY SCHEME. — A town's meeting at Torquay has adopted a contributory scheme for the recently opened Torbay Hospital. Contributors will be divided into three classes. Class 1 will have an income-limit of £200 a year for a single person over 16, or a widow or widower without children under that age, who will contribute a penny a week. Class 2 will have an income-limit of £250 for married couples without children under 16, and persons with one dependent under that age, who will contribute twopence per week. Class 3 will have a limit of income of £300 for married couples with a child or children under 16, and persons with more than one dependent under that age, who will contribute threepence weekly. Letters will be required only for non-contributors, who will be expected to pay towards their maintenance at the hospital and for the use of the ambulance.

THE FUTURE OF SURGERY.—In the course of an address delivered in opening the new operating theatres at the Leicester Royal Infirmary on Jan 23rd, Mr. C. J. Bond said that it was quite likely that the principles and practice of surgery would undergo change and development as knowledge grew. For instance, it might be that the all-penetrating beta and gamma rays, with their associated bombarding projectiles from a disintegrating radium atom on its way to become lead, would exercise a more discriminating and lethal effect on growing and multiplying cancer cells than the sharpest knife of the most skilful surgeon. It might be that, instead of incising and draining abscesses, the surgeon of the future would be busy in preventing their formation by the timely supply into the blood stream of antitoxins and other immunity-conferring materials. The surgeon of to-morrow must be a pathologist as well as a surgeon. He must be more and more concerned with the biochemical and physiological principles which underlie the healing of wounds, and normal and disorderly cell growth. In the industrial world to-day there was a danger that the man might be enslaved by the machine. In the same way a too rigid observance of ritual, and a too confined attention to the merely mechanical side of the art of surgery, must not be allowed to limit the surgeon's outlook. He was, or should be, concerned with living forces, not dead.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, Jan. 28th.—8 P.M., ODONTOLOGY. Casual Communications: Mr. A. T. Pitts: Two Compound Composite Odontomata. Dr. J. Kingston Barton: The Prevention of Diseases of the Teeth in Children. Mr. W. Rushton: The Use of Cement Linings in Cavities. Paper: Mr. G. B. Pritchard: Some Notes on the Origin and Prevention of Gingivitis.
FRIDAY, Feb. 1st.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.) Demonstration of some graphic records of instability illustrative of cases referred to by Mr. Sydney Scott, by Dr. A. Lowndes Yates. Papers: Mr. Sydney Scott: Vertigo. Mr. A. R. Tweedie: Some Notes on the Rotation Caloric and Galvanic Tests. Cases and specimens will be shown by Mr. E. A. Peters, Mr. M. Vlasto, Mr. Archer Ryland, Mr. W. N. M. Girling, and Mr. Eric Watson-Williams. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Cases and specimens will be shown by Mr. Eric Watson-Williams, Mr. F. J. Cleminson, Mr. Norman Patterson, and others. 8.30 P.M., ANÆSTHETICS. Paper: Dr. R. D. Lawrence: Post-operative Acidosis.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Jan. 28th.—8.30 P.M., Discussion on Starvation in Treatment, introduced by Dr. E. I. Spriggs, followed by Sir Thomas Horder.

ROYAL INSTITUTION, 21, Albemarle-street, W.
THURSDAY, Jan. 31st.—5.15. P.M., Sir William Bragg: The Early History of X Rays.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn, W.C. (Hunterian Lectures.)
MONDAY, Jan. 28th.—5 P.M., Prof. Arthur Evans: Developmental and Enterogenous Cysts and Diverticula.
WEDNESDAY.—5 P.M., Prof. G. E. Gask: Treatment of Malignant Diseases by Radium (with demonstration of patients).
FRIDAY, Feb. 1st.—5 P.M., Prof. C. A. Pannett: Local Anæsthesia in the Surgery of the Upper Abdomen.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Jan. 28th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.
FRIDAY, Feb. 1st.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.
TUESDAY, Jan. 29th.—5 P.M., Dr. W. J. O'Donovan: Exfoliative Dermatitis.
THURSDAY.—5 P.M., Dr. H. Haldin-Davis: Pruritus, Prurigo, Lichenification.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Jan. 28th, to SATURDAY, Feb. 2nd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., at 5 P.M., Lecture, Mr. Malcolm Hepburn: Some Apparent Difficulties of General Practitioners in Ophthalmic Work.—HOSPITAL FOR CONSUMPTION, Brompton, S.W. Tues., at 4.30 P.M., Clinical Demonstration by Dr. Batty Shaw.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Tues., at 4–6 P.M., Lecture: The Injection Treatment of Varicose Veins, followed by a demonstration of the methods and results in over 50 cases by Mr. Rodney Maingot.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M., Demonstration by Dr. R. A. O'Brien on Vaccines and Sera: their Prophylactic and Therapeutic Value in General Practice. The above are free.—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. Intensive course in Medicine, Surgery, and the Specialties, for two weeks.—BETHLEM ROYAL HOSPITAL, S.E. Tues. and Sat., at 11 A.M., Lecture-demonstrations.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. Second week of special course. Further particulars from the Secretary.

NATIONAL HOSPITAL, Queen-square, Bloomsbury
MONDAY, Jan. 28th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Williamson Noble: Optic Neuritis.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Transient Hemiplegias and Similar Cerebral Attacks.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Methods of Testing the Eighth Nerve.
FRIDAY, Feb. 1st.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Methods.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Jan. 31st.—4 P.M., Mr. Lloyd: Some Orthopædic Principles.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE, Manchester.
FRIDAY, Feb. 1st.—4.30 P.M. (at the Whitworth-street West Branch), Dr. Dougal: The Management of Occipito-posterior Positions.

NATIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, Jan. 30th.—5 P.M. (at the Medical Society of London, Chandos-street, W.), Dr. Hugh Crighton-Miller: Dangerous Ages: Youth.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Feb. 1st.—3.30 P.M., Mr. Graham Simpson: Surgical Cases.

Appointments.

ABEL, A. LAWRENCE, M.S. Lond., F.R.C.S. Eng., has been appointed Surgeon to the Cancer Hospital.
BACK, MARJORIE, M.D. Lond., D.P.H. Camb., Assistant Medical Officer of Health for the county of Surrey.
GARLAND, H. S., M.B. Lond., M.R.C.S., House Physician, National Hospital, Queen-square, W.C.
KEITH, F. L., M.D. Aberd., D.P.H., Medical Officer of Health for Deptford.
MILLER, ARTHUR A., D.L.O., M.R.C.S., Assistant Out-patient Registrar to the Central London Ear, Nose and Throat Hospital.
WEBSTER, J. M., M.B., Ch.B. St. And., F.R.C.S. Edin., Surgeon to the Sheffield City Constabulary.
Certifying Surgeons under the Factory and Workshop Acts: BICKNELL, A., M.D. Liverp. (Holylake, Chester); FULLERTON, J. A., M.B., Ch.B. Edin. (Mossley, Lancs.); HAMMERTON, G. H. L., L.R.C.P., L.R.C.S. Edin. (Dewsbury); STEWART, W. P. A., M.B., Ch.B. Glasg. (Kilbride-Bute); and WHITLEY, J. T., M.B., Ch.B. Manch. (Chelmsford, Essex).

Vacancies.

For further information refer to the advertisement columns.

Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Birkenhead General Hospital.—Hon. Physician.
Birmingham, Little Bromwich, City Hospital for Infectious Diseases.—Fourth Asst. M.O. £300. Also Two Visiting Surgeons. Each £200.
Birmingham Royal Cripples Hospital.—Sen. H.S. £400.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.
Bolton, Townleys Hospital, Farnworth.—Asst. M.O. £400.
Bradford Royal Infirmary.—Two H.S.'s. Each £150.
Cardiff Royal Infirmary.—Ophth. H.S. Also Gynæcological H.S. At rate of £75 and £50 respectively.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. At rate of £75.
Chadwick Trustees.—Two Travelling Scholarships. £400 each.
Charing Cross Hospital, W.C.—Asst. Physician.
Coventry and Warwickshire Hospital.—Res. H.S. £125.
Dreadnought Hospital, Greenwich.—Physician to Out-patients.
Durham County Council, Education Department.—Asst. School M.O. £600.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Asst. Pathologist.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Glasgow, Gartloch Mental Hospital, Gartcosh.—Jun. Asst. M.O. £300.
Glasgow Royal Cancer Hospital.—Medical Officer. £600.
Gloucester County Mental Hospital.—Jun. Asst. M.O. £350.
Great Yarmouth, General Hospital.—H.S. £150.
Hospital for Sick Children, Gt. Ormond-street, W.C.—Cas. O. £400. Also Asthma Research Scholar. £300.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Asst. Surgeon.
Ilford Isolation Hospital.—Temporary R.M.O. £350.
Jersey Mental Hospital.—Med. Supt. £650.
Leyton Borough.—Asst. M.O. £600.
London Temperance Hospital, Hampstead-road, N.W.—Med. Reg. 40 guineas.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. Also H.S. to Ear, Nose and Throat Dept. Each at rate of £200.
Malayan Medical Service.—Medical Officers. £700 per annum.
Melbourne University, Victoria, Australia.—Chair of Obstetrics. £2000.
Metropolitan Asylums Board.—Bio-chemist at the Board's Anti-toxin Establishment, Sutton, Surrey. £600.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Asst. Radiologist.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Surgeon.
Plymouth, South Devon and East Cornwall Hospital.—Cas. H.S. At rate of £100.
Preston Union.—Jun. Res. M.O At rate of £104.
Princess Louise Kensington Hospital for Children, North Kensington.—Hon. Asst. Surg.
Queen's Hospital for Children, Hackney-road, E.—Asst. Surg.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.
Salisbury, General Infirmary.—Res. M.O. £150.
Southampton County Borough.—Asst. School Dentist. £150.
Stafford, County Mental Hospital.—Second Asst. M.O. £600.
Swansea County Borough Infectious Diseases Hospital.—Res. M.O. £350.
Warwickshire County Council.—Asst. County M.O.H. £600.
Wellington Hospital, New Zealand.—Orthopædic Specialist. £900.
West Bromwich, Hallam Hospital, Hallam-street.—Ophthalmic Surgeon. £75.
West London Hospital, Hammersmith-road, W.—Hon. Obstetric Registrar.
Willesden General Hospital, Harlesden-road, N.W.—Hon. Ophthalmic Surgeon.
Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—H.S. At rate of £125.
Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.
York, The Retreat.—Jun. M.O. £300.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at New Tredegar (Monmouthshire), Grampound (Cornwall), Drummore (Wigtownshire), Pulborough (Sussex), West Linton (Peeblesshire), Kippen (Stirlingshire), and Waltham Abbey (Essex).

The Home Secretary gives notice of vacancies under the Workmen's Compensation Act, for the Districts of the Abergavenny and Blaenavon, Crickhowell, Monmouth, and Tredegar, Abertillery and Bargoed County Courts, and for the Districts of Llangefni, Holyhead and Menai Bridge County Courts (Circuit No. 29). Applications should reach the Private Secretary, Home Office, not later than Feb. 7th.

Births, Marriages, and Deaths.

BIRTHS.

ALEXANDER.—On Jan. 16th, at Queen-square, Lancaster, the wife of Dr. Alexander, of a son.
ANDERSON.—On Jan. 19th, at Ribblesdale House, Hornsey, the wife of Roy S. Anderson, M.R.C.S., L.R.C.P., of a son.

MARRIAGES.

BRAHAM—HINCKS.—On Jan. 21st, Noel Braham, O.B.E., M.C., F.R.C.S., to Mrs. Ruth Hincks, daughter of the late Ludwig Wiborg, of Brevik, Norway.

DEATHS.

BAKER.—On Jan. 16th, suddenly, at Elmstead, Andover, Hants, Henry Francis Baker, F.R.C.S., aged 83.
BIANCHI.—On Jan. 17th, at Brighton-place, Portobello, Edinburgh, Leo Ferdinando Bianchi, F.R.C.S., F.R.C.P. Edin.
BIRKETT.—On Jan. 19th, at "Merrilyn," Lee-on-the-Solent, Dr. H. J. D. Birkett.
BROOK.—On Jan. 7th, at Biskra, Algeria, Rev. Thomas Brook, B.D., LL.D., M.D., D.P.M., Chaplain to the Forces (retired), aged 58 years.
COLBORNE.—On Jan. 15th, at Hayling Island, the Rev. George Colborne, M.A., Ph.D., M.R.C.S., L.R.C.P., aged 83 years.
HUCKLE.—On Jan. 13th, at Tillington Lodge, Hastings, Arthur Henry Headley Huckle, J.P., of the Middle Temple, Barrister-at-Law, M.R.C.S., L.R.C.P., D.P.H.
SOWDEN.—On Jan. 19th, at St. Giles, Elgin, George Smith Sowden, M.A., M.D., aged 46 years.
SQUIRE.—On Jan. 13th, at Granville Lodge, Westgate-on-Sea, Maurice Frederick Squire, M.D., M.R.C.S., L.R.C.P.
VICKERY.—On Jan. 12th, at Brighton, after a short illness, Alice Vickery, L.R.C.P. Irel., in her 85th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. II., 1928.

THE Index and Title-page to Vol. II., 1928, which was completed with the issue of Dec. 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

THE TRAINING OF THE COMPLEAT CHYRURGION:

THE BACKWARD LOOK AND THE LOOK AROUND.*

BY ARCHIBALD YOUNG, B.Sc., M.B., C.M., F.R.F.P.S. GLASG.,

REGIUS PROFESSOR OF SURGERY, UNIVERSITY OF GLASGOW.

THE training of "the compleat chyrurgion" must be a thorough and comprehensive process, and cannot be accomplished even approximately within the limited number of years that he is an undergraduate. Only if his early training is well founded and securely based may one look with confidence for the larger development and the greater competency that the surgeon must have if he is to be in any real sense "compleat." His training must go on without cessation all through his active life, and he must keep himself *au fait* with every development of his science and of his art. Reading, observation, experiment, discussion with others, young as well as old—and perhaps he will get in many ways a greater inspiration from the former than from the latter—these and other sources of knowledge and of improved technique must be utilised to the full. Two directions of study, two aspects of the surgeon's training, will amply repay cultivation: medical history and travel.

THE BACKWARD LOOK.

We are apt to get into the habit of assuming that most of the achievements of the surgery of to-day are peculiar to this century, half century, or even this last decade; that there was indeed no such thing as surgery, as we now understand it, until almost within the memory of our grandfathers. It is a very salutary corrective to this impression or assumption to glance back for a little upon the history of surgery in the past. It is not its earlier primitiveness, its extremely limited scope and achievement in earlier times, that surprise us, but rather the extraordinary state of development, especially on the technical side, to which it had attained even many centuries ago. As far back as 360 B.C., Hippocrates made use of counter-irritation, used the actual cautery, set fractures, and trepanned the skull. Celsus (A.D. 17) performed lithotomy. He did amputations. He described an operation for cataract. He was probably the first to recommend the ligature of arteries for the arrest of hæmorrhage. He even attempted the radical cure of hernia. Like Hippocrates, he trepanned or trephined the skull. Galen (A.D. 150) developed the art of bandaging, described and used complicated machinery for the treatment of fractures and dislocations, and like Celsus, employed ligatures for the control of hæmorrhage. Paulus Æginata (A.D. 700) performed many operations, such as lithotomy, laryngotomy, tracheotomy, and amputation of the breast. One might multiply evidence of this kind almost indefinitely. Let us trace the history of the development of surgery in one particular department.

The Operation of Trepanning.

Trepanning certainly goes back as far as the time of Hippocrates—that is, over 300 years before the Christian era—but Lucas-Championnière, in his "Les Origines de la Trépanation décompressive," depicts a skull from the Neolithic period, which shows a large smoothly rounded orifice in the left parieto-occipital region, almost certainly the relic of a therapeutic trephining. Had it been done at the present day it could hardly have been bettered; and it must have been done with flint. Victor Horsley, after making a careful investigation of the skulls in the Broca Museum in Paris, in 1887, concluded: "(1) That the operative openings were nearly always over the site of representation of movement on the cerebral cortex; (2) that the patients had probably been suffering from Jacksonian epilepsy; (3) that the operation would gain a certain reputation for the cure of convulsions generally; and (4) that at least some of the operations—e.g., for depressed fracture—would result in cure" (Ballance).

It is clear that Hippocrates trepanned the skull for the purpose of decompression, to relieve inflammation, for the evacuation of pus and blood, and for the extraction of foreign bodies. His writings show also—and this is perhaps the most remarkable fact of all—that he recognised the contralateral distribution of convulsions and paralyses following upon certain head injuries. It is on record, too, that he recommended the use of the trephine for the treatment of blindness not due apparently to any obvious disease of the eye. This is surely the very earliest known recognition of the value of decompressive trephining for the relief of optic neuritis. Celsus advocated trephining for the evacuation of blood poured out between the dura and bone, and forming a clot, even where the bone was not obviously broken. From these early times and on through the centuries operations on the skull continued to be practised, and we find in the writings of Roger of Salern (A.D. 1170), Walter of Agilon (middle of thirteenth century), Ambrose Paré (1560), Andreas a Cruce (1573), Fabricius Hildanus (1560–1634), references to trephining or trepanning for fracture of the skull, for the relief of pressure by blood or pus, and for the treatment of "dolor capitis." Descriptions are given as to how a sufficiently large opening may be made by joining up adjacent trephine holes, to allow of the removal of the intervening bone. There are in some of the works—e.g., those of Andreas a Cruce and Peter Paaw—numerous illustrations of such operations and of the instruments employed. It is of interest to compare the latter with some of our present-day instruments; the resemblances are more remarkable than are the differences. Some of the instruments credited to Hippocrates—both trepans and trephines—are furnished with devices to prevent them penetrating too deeply. These devices are in some cases bars or rings; some of the instruments are bevelled from below upward; some of the trephines have metal collars not unlike the collar guard of the trephines of to-day.

There are other simpler instruments figured in the same works which bear a very close resemblance to many in common use at the present time. The words of the Preacher must surely come back to our minds, as we survey the armamentarium of Hippocrates, and compare it with our own: "The thing that hath been, it is that which shall be; and that which is done is that which shall be done and there is no new thing under the sun. Is there anything whereof it may be said—See, this is new? It hath been already of old time, which was before us."

Percival Pott (1713–1788), Petit (1674–1750), John Hunter (1728–1793), Larrey (1766–1842) and others, with varying courage and with a gradually advancing degree of clinical exactitude, carried out operations on the skull for injuries occurring both in civil and in military practice and began to correlate clinical observation with operative and post-mortem findings. Larrey, for example, observed the effects of injury to various regions of the brain, and noted some facts of importance in cerebral localisation such as loss of memory, aphasia, contralateral palsy, the homolateral paresis of cerebellar lesions, the respiratory failure of cerebellar lesions, and the connexion of cerebellar abscess with otitic disease. Petit's instruments are very similar to some that have been in common use in our own time. His trephine was cone-shaped, and had outside serration. His "trépan exfoliatif" was very like the carpenter's bit of the present day. In the writings of Hunter there are accounts of operations by him upon the skull, the brain and the meninges, and his records are good examples of his well-known carefulness in observation and in reporting. Trepanning, however, passed through many vicissitudes and its repute varied widely from time to time. For example, so recently as 1840 Pirrie said: "These fractures, and the numerous inventions of instruments for cutting the skull, are sad monuments of the Surgery of past ages." That the lay mind, however, even quite early, was not averse from seeing good in the operation, is attested by many examples, and there is the historic instance of Philip Count of Nassau, who was thrown from his horse while riding and sustained a fracture of the skull. Having ultimately made a good recovery, he gave his surgeon the following testimonial: "I, the underwritten Philip Count of Nassau, hereby declare and testify that Mr. Henry Chadborn did trepan me in the skull 27 times, and after that did cure me well and soundly." Astley Cooper (1768–1841), though he practised trephining in selected cases, seems to have discouraged it, except in compound fractures of the skull, though he mentions one case of cure of Jacksonian epilepsy by operation.

The rule of practice established by Pott was to the effect "that, in every case of fracture of the skull, with depression the skull should be perforated, and the depressed fragment of bone either raised to its proper level or entirely removed." This rule came to be set aside, it appears, mainly by reason of the authority of Abernethy who, about the year 1811 A.D., set forth as his opinion that trephining might often be dispensed with, even in fractures of the skull where depression of bone was definitely known to be present. In support of his view Abernethy related five cases of fracture of the skull with depression, which he had under his care at St. Bartholomew's Hospital within 12 months, and which terminated favourably though no operation was performed. Thereafter, according to Francis Adams, in "The Genuine Works of Hippocrates," "it became the established rule of practice in British surgery never to interfere in cases

* Abstracted from a presidential address delivered to the Glasgow University Medico-Chirurgical Society.

acture of the skull unless with the view of removing rgent symptoms." This reactionary teaching seems to ave held the field for close on 30 years, and in accomtishing its overthrow, and bringing back surgical opinion o the teaching of Pott, Francis Adams ascribes a notable lace to what he terms "the elaborate and trustworthy atistics, published in 1844 A.D., by Dr. Lawrie of Glasgow" ater Regius professor of surgery—the immediate preecessor of Lister). These statistics were compiled from ie records of the Glasgow Infirmary. Lawrie's conusion was as follows: "From what we have said, it will ppear that we coincide with those who, in using the 'ephine, in cases of compound fracture of the skull, look iore to the state of the bone than to the general symtoms, and who employ it more as a preventive of nflammation, and its consequences, than as a cure for rgent symptoms, the immediate result of the accident." his is surely a very unique and remarkable example of the alue and effect of carefully compiled statistics and careful eduction therefrom.

THE "LOOK AROUND."

It has long been an accepted fact that travel is a valuable djunct in any liberal system of education. No nation robably more than the Scots have recognised the educative alue of travel. Even in mediæval times Scotsmen travelled ar abroad, in France, Italy, and the low countries. Scots udents were found at many continental colleges and niversities, and not a few Scotsmen even held professorial hairs abroad. In addition to those who travelled thus or purely educative purposes, many spent time and fortune n the Spanish Wars and in the wars in the Low Countries, eturning later on to play their several parts at home. ven in comparatively recent times, a period of travel broad has been generally regarded as an important factor n the completion of a good general education, so that uch a term as the "travel year" or "Wanderjahr" has ound its way into accepted literature and even into classical ictionaries. If desirable as an adjunct to any liberal eneral education, it is all the more to be recommended s a valuable agent in the training of the surgeon.

The special benefits to be expected from properly directed ravel are many. Other people, other methods of working, ther points of view encountered in the course of travel ust suggest to the receptive imagination new aspects f truth, which, after all, is many sided. It is well to ealise that truth is not bound up in a closed packet, possessed y any one school of thought, but is the heritage of all, nd it is bound to be appreciated in different ways by iffering schools of thought. It follows that the practical pplications of truth have many different possibilities, nd it may be the lot, or the luck, of one school to perceive direction of advance that is obscured to other schools. he surgeon who visits other schools, with an open mind, an hardly fail to pick up ideas that may fructify in many seful ways. In his own school, and working constantly mong others of his school—competent though they be—he surgeon is apt to become wedded to stereotyped methods nd locally accepted dogma. Let him travel, visit other chools, whether at home or abroad, and witness the work f others. He is set a-thinking, and his outlook is inevitably roadened. So must his technique and his practice profit y what he sees, whether or not he be led to adopt the new nd to discard or modify the old.

There is little doubt that one of the most attractive eatures of a travel tour, whether at home or abroad, is he opportunity it affords of seeing some of the famous ien whose names are known to us by their notable researches r writings. It will not always happen that contact with man and his work will confirm a preconceived estimate ased on the study of his writings, but even disillusionment s a definite gain, for one knows thenceforward what value o place upon further publications from the same source. t has, however, seldom been my experience to encounter uch disillusionment. In nearly every case the man whom have judged on the basis of his published works to be a reat surgeon has proved to be greater than his writings, nd it has been, in consequence, a satisfaction and an nspiration to see him at work in his own clinic or laboratory. chools achieve fame, centres of learning acquire distinction, argely in virtue of the great names upon the rolls of their rofessoriate or teaching staff. It is almost always the nan who counts, and the traditions of a school are built p on the records of work done by famous members of the taff, whose memory and whose standing are held in high onour by alumni and adherents. The great surgeon whom lone you desire to meet upon your travels will be a man ompounded of all sorts of qualities, amongst which mere nanual dexterity, and what might be called brilliancy in perating, may take but a secondary place. But no urgeon can be truly great unless his practice be humane, nd unless he be as honest with himself as with his fellows, laiming for no procedure, for no operation—however rilliant or however personal to himself and to his reputation —one jot of credit more than its results indisputably warrant.

At what stage in his career should the surgeon fare forth to see the world? Should he set out immediately his Alma Mater has conferred on him his graduate degree? Or should his "Wanderjahr" come later on, when a further spell of post-graduate study has already added substantially to his groundwork of knowledge? This is a question that is not easy to answer. The decision will depend very much on the manner in which he proposes to plan his travel. If he intends to go to one or two places only, and to settle down there for a definite period of continuous study, under the guidance of a man who is an acknowledged authority in the special line of his projected study, then I see no reason for delay. But I doubt if, at this early period of his career, the young surgeon will profit much by a mere tour of travel in which he visits many different clinics, spending, it may be, but a day or two in each. The fresh graduate is unlikely yet to have the mental balance which would enable him to profit by such a haphazard collection of observations as he may thus acquire. For the mature man, well grounded in his science and well versed in its modern developments, who has already acquired for himself a substantial experience and who is now fitted to assess values, it is a very different thing. For him it will be, in the years that follow, a means of constant refreshment to visit other schools and clinics, and will serve him as a recurring corrective in his practice. To the immature man, the effect of such a tour may even be harmful, in that it may lead him to form erroneous opinions, based on insufficient data and wrongly assessed impressions. Let it not be supposed that travel as a means of surgical training must be necessarily or exclusively travel abroad. Much may be gained by visits to schools and clinics in our own country, and I have often thought that it would be a good thing if we had some regular and regularised interchange of students and of teachers between the various schools at home.

From his travel tour the surgeon will return, I hope, with much valuable information, and many new ideas, to help him in his further development. But I am confident that you, if you travel, will have the same experience as I have had; the same feeling of deep satisfaction that has been mine in coming again amongst our own people. With each recurring visit I pay to other clinics I come back to my own with a deep sense of satisfaction. There *are* things—and they are not few—which we do better here than elsewhere; there *are* many aspects and departments of surgery which are certainly as far advanced, as well developed, here as in other schools. We are heirs to great traditions; let us see that these great traditions remain unsullied.

PUBLIC HEALTH IN NORTHERN RHODESIA.

THE territory known as the Protectorate of Northern Rhodesia lies between longitudes 22° E. 35′ E., and between latitudes 8° 15′ S. and 18° S. It is bounded on the west by Angola, on the north-west by the Belgian Congo, on the north-east by Tanganyika Territory, on the east by the Nyasaland Protectorate and Portuguese East Africa, and on the south by Southern Rhodesia and the mandated territory of South-West Africa—comprising in all an area that is computed to be about 278,950 square miles. The River Zambesi forms the greater part of the southern boundary; its two main northern tributaries are the rivers Kafue and Luangwa. With the exception of these river valleys, the territory consists of a table-land varying from 3000 to 4000 feet in height, though in the north-eastern portion, and especially in the vicinity of Lake Tanganyika the altitude is greater. At the present time statistics are available of 70 different tribes resident in the Territory, and there are said to be 38 distinct native languages in use. Previous to 1889 the whole territory had been vaguely included in the Charter granted to the British South Africa Company, but in that year the Barotseland (North-Western Rhodesia) Order in Council placed the administration of the western portion of the country by the company on a firm basis; and this was closely followed by the North-Eastern Rhodesia Order in Council of 1900 with similar effect. The two territories were amalgamated in 1911 under the designation of Northern Rhodesia, and the administration of the company continued until 1924, when, in terms of a settlement arrived at between the Crown and the Company, the administration of the Territory was assumed by the Crown, and the first Governor (Sir H. J. Stanley) was appointed on April 1st of the same year. He was succeeded in August, 1927, by Sir J. Crawford Maxwell.

Climate.

There are considerable climatic differences between various parts of the country. The Zambesi, the Luangwa, and the Kafue valleys experience a much greater humidity and a more trying heat than do the plateaux above 3500

or 4000 ft. The hottest months are October and November, before the rains break, when the mean maximum is about 97° F. in the Zambesi valley stations and 85° at plateau stations. The mean maximum for the eight months of the hot season (September to April) is approximately 90·3° with a mean minimum of 64·5° while the corresponding figures for the four months of the cold season (May to August) are 78·7° and 46·6° The highest temperature recorded in the Territory was 116° at the Barotse National School in October, and the lowest was 22° at Sesheke in July.

The rainy season usually commences in November and lasts until April, after which month rain is only rarely experienced, and then in negligible quantities. The rainfall recorded at Livingstone was 19·17 in., at Broken Hill 31·42 in., at Fort Jameston 41·82 in., and at Abercorn 44·17 in. In the western districts 55·51 in. were recorded at Mwinilurga and 46·36 in. at Mongu. Minor earth tremors were felt at various places in the Territory.

Vital Statistics.

In the latest official report on the affairs of the Protectorate, prepared by Mr. G. A. S. Northcote, Chief Secretary, the native population is estimated at 1,237,486. There is, it is stated, no system of birth or death registration possible at present and consequently no figures are available from which vital statistics may be obtained. Infantile mortality is known to be high and has been estimated to be between 40 per cent. and 50 per cent. of children born. The European population in 1927 was 7275, and their general health was good. The death-rate per 1000 was returned at 9·89 (as against 11·1 in 1926, and 13·7 in 1927). 144 children were born, which represents a crude birth-rate of 20 per 1000 as compared with 25·4 per 1000 in 1926.

Hospitals.

The Government maintains European hospitals at Livingstone, Lusaka, Broken Hill, Fort Jameson, and Kasama. Native hospitals are maintained at these places, and also at Mazabuka, Solwezi, Ndola, and Fort Rosebery. In addition, many mission doctors, hospitals, and dispensaries receive annual subsidies from the Government for medical work in native areas. During the year, 923 Europeans and 7288 natives were admitted to hospital and there were 27 and 418 deaths respectively among them. No complete records as to the number of patients treated at out-stations are available for either the European or the native population, though it is estimated that the latter are about 5000, many of whom were treated for trivial complaints.

Infectious Diseases.

One European and 22 native cases of *sleeping sickness* came under treatment, eight of the latter proving fatal. The only epidemic manifestation of the disease was on the Mwangazi River in the Fort Jameson sub-district. Isolated cases of what is presumed to be sleeping sickness have been reported from various parts of the Luangwa Valley, but the disease is not now prevalent there.

The following table gives the number of persons admitted to hospital suffering from *malaria* and *blackwater fever* with mortality statistics in each case, figures being also given for 1925 and 1926 :—

Year.	European population.	Malaria.		Blackwater fever.	
		Cases.	Deaths.	Cases.	Deaths.
1927 ..	7275 ..	272	6 ..	20	5
1926 ..	5581 ..	262	1 ..	21	7
1925 ..	4624 ..	211	6 ..	13	7

Influenza has been present over the whole Territory, but the incidence shows a decrease on previous years. The results of the treatment of yaws with bismuth and sodium tartrate continue to be satisfactory; this disease is chiefly prevalent in the Kasempa, Kafue, and Luapula areas.

Native Department statistics show that there are 5218 *lepers* in the Territory, of whom 3816 have been notified to the medical officers. No statistics are available for mortality. A system of voluntary segregation in coöperation with the various missionary societies will shortly be commenced and gradually developed in combination with the establishment of treatment centres for early cases.

Outbreaks of *small-pox*, *chicken-pox*, and *Kaffir-pox* occurred in many parts of the Territory, but were for the most part localised. The mortality-rate was low. 177,290 persons were vaccinated, and, as far as can be ascertained, the results were successful in about 80 per cent. of cases.

Ankylostomiasis is widely distributed amongst the native population. It is impossible to state with any accuracy to what extent bilharziasis is present. Hospital statistics show an infection-rate of about 0·5 per cent. of those examined. It is hoped that in time circumstances will permit of a more comprehensive survey of this and other diseases, and will facilitate the institution of intensive treatment.

(*Continued at foot of next column.*)

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 166.*)

THE following is the text of the official bulletins which have been issued during the past week and signed by Sir Stanley Hewett and Lord Dawson of Penn :—

THURSDAY, JAN. 17TH. 11.30 A.M.

The King has had a good night and progress, though slow, is satisfactory. The next bulletin will be issued on Friday evening. (Signed also by Sir Hugh Rigby.)

FRIDAY, JAN. 18TH. 8.15 P.M.

The King has had a quiet day. There is no change to report in His Majesty's condition. The next bulletin will be issued to-morrow night.

SATURDAY, JAN. 19TH. 8.30 P.M.

The King continues to make slow progress. The amount of nourishment taken in now satisfactory and the general strength is improving.

TUESDAY, JAN. 22ND. 12 NOON.

The King has had a quiet night. The temperature has now remained normal for many days, and the condition of the pulse satisfactory. The empyema wound is small and steadily healing. With a returning appetite the amount of nourishment is adequate and includes solid food. Although the general strength shows improvement, there is not as yet any appreciable increase in weight. We feel the time is approaching when His Majesty's removal to sea air will be advantageous. (Signed also by Sir Hugh Rigby, Sir Farquhar Buzzard, and Sir Humphry Rolleston.)

(*Continued from previous column.*)

There is no indication of the distribution or extent of *tuberculosis*. That the degree of infection is low is indicated by native hospital and out-patient returns and by the medical examination of large numbers of natives for various purposes.

The continued activity in mining operations in the Territory has provided Northern Rhodesia natives with a labour market comparatively close to their homes, and, generally speaking, the response has been very satisfactory. Northern Rhodesia mines offer wages and conditions of housing, feeding, and general attention which compare favourably with the extra territorial labour centres which compete for the Territory's labour.

"OUR TOUNIS COLLEGE."

AN anthology[1] of verse, compiled from the pages of the *Student* by David B. Keir and Walter P. Kennedy, has been issued by the Students' Representative Council of the University of Edinburgh as part of a considered effort to foster the interest in the history and tradition of the University which has become apparent in the post-war renaissance. It consists of over 300 poems which have appeared in the *Student* during the last 40 years, with a few more from other, and earlier, sources. It contains fare to suit all tastes—the gay, the grave; the plaintive and the boisterous; love songs and drinking songs; and excellent fooling; all are here. For the most part the verses reach a high level and possess intrinsic merits which raise them much above the standard of the ordinary college magazine. And although we are told that the volume has been primarily prepared for students and alumni of Edinburgh, we believe it will appeal to a wider public.

PLASMOCHIN IN MALARIA AND BLACKWATER FEVER: A CORRECTION.

IN summarising last week (p. 166) the important work of Dr. Drenowsky on the treatment of malaria by plasmochin in a Bulgarian country practice, the safe dose of this drug was stated not to exceed 0·01 g. per kg. of body-weight. This should have read 0·01 g. per 10 kg. of body-weight, which works out at about gr. 1 (not grs. 10) for a 10-stone man. As the larger dose may easily produce serious results we desire to call immediate attention to the correction.

[1] Our Tounis College. Edinburgh: The Darien Press. 1928. Pp. 412. 3*s.* 6*d.*

Arris and Gale Lecture

ON

LYSOZYME.

A BACTERIOLYTIC FERMENT FOUND NORMALLY IN TISSUES AND SECRETIONS.

Delivered before the Royal College of Surgeons of England

BY ALEXANDER FLEMING, F.R.C.S. ENG.,

DIRECTOR OF THE DEPARTMENT OF SYSTEMATIC BACTERIOLOGY, ST. MARY'S HOSPITAL; PROFESSOR OF BACTERIOLOGY IN THE UNIVERSITY OF LONDON.

LYSOZYME is a word I use to denote a ferment-like substance which has the power of killing and dissolving bacteria, and which is widely distributed throughout the body. It is found in most of the secretions and all the tissues of man, and is present in the tissues of other animals and in some vegetables. The bacteriolytic action of lysozyme is not manifest on all bacteria equally. Although it can be shown to have some destructive effect on many pathogenic bacteria, its extraordinary bacteriolytic effect is most easily shown on non-pathogenic bacteria, although even among these there are great differences in sensitiveness. I succeeded in isolating a coccus which is remarkably sensitive to the action of lysozyme, and I have used it largely in investigating the properties of the ferment. Because it is easily dissolved I have called this microbe *Micrococcus lysodeikticus*. When the concentration of lysozyme is great, as in tears or egg-white, solution of this coccus is extremely rapid, so that within 30 seconds at body temperature the large, deeply staining cocci are changed to minute irregular specks of stainable material.

If a suspension of the test coccus be made in normal saline solution so that there is a very definite opacity (say, 5000 million cocci per c.cm.), and to 1 c.cm. of this be added 10 c.mm. of tears (if the tube be kept at 37° C., or better still at 45° to 50° C.), the cocci will be found in a few moments to have undergone complete solution, so that the turbidity will have disappeared and the fluid will be perfectly clear. Tears have the same effect on many fæcal streptococci, but it may take an hour or so to complete the action. Such a rapid and powerful bacteriolytic effect cannot be shown with any other type of antibacterial agency in the body. A very striking demonstration of the rapidity of solution of the cocci by material rich in lysozyme is afforded by taking a thickly grown plate culture of *M. lysodeikticus*, placing on it drops of tears, egg-white and normal saline, and then tilting the plate so that the drops run down over the surface of the growth in separate streaks. After about one minute the thick opaque growth of the coccus will have become transparent where the tears and egg-white have run down, but unaltered where the saline has flowed.

The fact that lysozyme acts as well on dead bacteria as an old culture is in striking contrast to the action of a bacteriophage, which only shows a lytic effect on young, rapidly growing cultures.

The lytic substance is rapidly diffusible through a medium such as the ordinary agar which is used as culture for bacteria.

This can be shown by taking a culture plate of nutrient agar and punching out of the centre a small piece of the medium—e.g., 6 mm. in diameter. Ten c.mm. of tears, egg-white or other lysozyme-containing material, or a small piece of tissue, such as cartilage or liver, is placed in this cavity, and is then covered over with melted agar. When this has solidified, fresh agar is poured over the whole surface of the plate, and then it is thickly planted with *M. lysodeikticus* and placed in the incubator. Next day there will be a thick growth of the coccus all over the plate except over the embedded tissue or secretion, and for a distance up to about 1 cm. around.

Thus, within 24 hours, there has diffused through the medium for a distance of perhaps 1 cm. sufficient lysozyme to prevent the growth of the test coccus. If the plate is further incubated for a week it will be found that diffusion progresses further, so that for a distance of another centimetre or more from the embedded material, the thick opaque growth which was first evident has become transparent and almost invisible from solution of the bacteria.

Occurrence of Lysozyme in the Human Body.

A great variety of tissues and secretions and excretions have been tested with *M. lysodeikticus* and other organisms to see whether they contain this lytic principle. *M. lysodeikticus* is of especial value because it detects smaller quantities of the lytic substance than less sensitive organisms. The lytic principle is present in all the human tissues examined and in most of the secretions, except normal urine, sweat, and cerebro-spinal fluid. The concentration however, varies greatly, as will be seen from Table I.

TABLE I.—*Showing the Relative Lysozyme Content of Tissues and Body Fluids.*

Material examined.	H.D.	Material examined.	H.D.
Synovial fluid ..	1 in 80	Liver	1 in 400
Blood serum ..	„ 80	Tonsil	„ 400
Pleural effusion (clear)	„ 80	Kidney	„ 100
Ascitic fluid ..	„ 50	Intestine ..	„ 500
Ovarian cyst fluid	„ 10	Stomach ..	„ 1000
Fluid from parotid cyst ..	„ 100	Meninges ..	„ 400 (*b*)
Semen	„ 20 (*a*)	Skin	„ 100 (*c*)
		Cartilage ..	„ 1300 (*d*)

H.D. = Highest dilution giving complete lysis of *M. lysodeikticus* in one hour at 45° C.

(*a*) Gave only partial lysis after three hours; (*b*) almost complete; (*c*) incomplete lysis; (*d*) in five minutes.

Of all the tissues cartilage had the strongest concentration, and an extract of cartilage corresponding to 1 part in 1300 parts of normal saline was capable of causing complete lysis of the test cocci in five minutes. On the other hand, the lytic action of brain tissue was so weak that when this was embedded in an agar plate, the surface of which was planted with *M. lysodeikticus*, the area of inhibition of growth was very small or might be absent if there were a thick layer of medium over the embedded tissue.

A number of different fluids from the same individual were tested together to ascertain their lysozyme content (Table II.).

TABLE II.—*Lysozyme Concentration in Fluids from the same Individual.*

Fluid examined.	H.D.	Fluid examined.	H.D.
Blood serum ..	1 in 270	Sputum	1 in 13,500
Tears	„ 40,000	Saliva	„ 300
Nasal mucus ..	„ 13,500		

H.D. = Highest dilution giving complete lysis of the test cocci in one hour at 45° C.

The great concentration of lysozyme in tears is very striking. The tears were secreted within a few seconds of the application of the stimulus, so it is clear that some cells in the lacrymal gland are capable of elaborating lysozyme very rapidly in high concentration or of effecting an enormous concentration of the lysozyme which they might obtain from the blood fluids.

Lysozyme exists also in very considerable concentration in leucocytes. This can be shown by placing two glass rings on a slide, filling one of them with blood, and incubating for one hour to allow of the emigration of the leucocytes on to the surface of the slide. The clot is now thrown off and the leucocytes which are adherent to the surface of the slide are washed from red corpuscles and serum, after which both cells are filled with a strong suspension

of *M. lysodeikticus*. After one hour's further incubation the cocci in the cell which had a carpet of leucocytes have all been dissolved, whereas in the control cell without leucocytes there is no solution of the cocci. In another experiment pus was shaken up with an equal volume of normal salt solution and a little ether as an antiseptic (ether was known not to interfere with the lysozyme). This was allowed to extract overnight, and then the fluid was titrated for lysozyme, when it was found that dilution of 1 in 2000 of this fluid was capable of completely dissolving a turbid suspension of the test coccus in 18 hours. It is clear, therefore, from both of these experiments that leucocytes contain lysozyme in high concentration. Ridley has estimated that the concentration is at least equal to that in tears.

The organs and secretions of some of the lower animals have been tested for lysozyme content. It was found that the lysozyme content in the rabbit and the guinea-pig was very much less than in man. The tissues of the dog stood midway between. The lysozyme concentration is greatest in hen's egg-white, and we have found that a dilution as low as 1 in 60,000,000 has some lytic effect on the test coccus. The yolk had no lytic action. There seems to be considerable differences in the lysozyme content of different birds, as is shown in the following experiment.

The same quantity of egg-white of four different species was embedded in an agar plate and *M. lysodeikticus* was planted thickly over the surface. After incubation there was a considerable difference between the areas of inhibition of growth over the different varieties of egg-white. The actual figures obtained were :—

	Diameter of area of inhibition.
Hen's egg-white	24 mm.
Moorhen's „	11 mm.
Thrush's „	16 mm.
Wagtail's	16 mm.

The tissues of a fish (pike) were found to contain much lysozyme, and its cartilage seemed to be quite as potent as that of man. The eggs of this fish were also found to be very powerful.

The tears of the rabbit, horse, sheep, and turkey were all 30 or more times less potent than those of man on *M. lysodeikticus*.

Among the common garden vegetables tested, the turnip showed the greatest content in lysozyme, but even this was very weak when compared with human tissues.

Action of Lysozyme on Different Bacteria.

While, for experimental purposes, *M. lysodeikticus* was usually selected as the most sensitive of the bacteria, at the same time observations were made on other microbes. Of a series of 104 strains of bacteria derived from the air of the laboratory, 75 per cent. were dissolved, more or less readily, by a 1 in 100 dilution of sputum, and 28 per cent. were completely dissolved in one hour.

With bacteria isolated from the human body very variable results were obtained. That this must be so will be obvious when we have dealt with the problem of resistant microbes. Of all the common organisms inhabiting the human body, it is probable that the group showing the least lysis is the *B. coli* group, whereas the most susceptible are the intestinal streptococci. In one experiment 15 strains of intestinal streptococci were placed in contact with undiluted synovial fluid for 8 hours at 45° C., with the result that 12 were completely, and 3 partially, dissolved. Even when tears were diluted 1000 times they still showed some lytic action on a large proportion of the intestinal streptococci. Even though no actual lytic action might be visible when lysozyme-containing fluid was allowed to act on such microbes as *B. coli* or *B. typhosus*, it exerted a bactericidal or inhibitory power on these bacteria. This can be seen in the following experiment.

Equal volumes of dilutions of tears and a suspension of *B. coli* were mixed and incubated for 1 hour when 10 c.mm. of the mixtures were plated, with the result shown in Table III.

TABLE III.

—	Dilution of tears.							Control no tear
	1/2	1/4	1/8	1/16	1/32	1/64	1/128	
Colonies of *B. coli*..	13	13	21	26	30	42	60	182

The various fluids tested did not always bear the same ratio to each other in their lytic power on the different microbes isolated from the human body. Tears, which were by far the most powerful toward *M. lysodeikticus*, were less lytic than sputum or synovial fluid to some other cocci. This may well have some bearing on the immunity of certain tissues to certain infections.

The Nature of Lysozyme.

When a protein precipitant such as trichloracetic acid, alcohol, or acetone is added to egg-white or other lysozyme-containing fluid, the whole of the lysozyme is carried down with the proteid precipitate. Wolff has been able to separate the lysozyme from the protein by precipitation with colloidal iron hydroxide and by further purification by evaporation at low temperature, dialysis, and repeated precipitation with acetone he has succeeded in isolating the whole of the lysozyme from egg-white, protein-free. The purified lysozyme was an amorphous, light-yellow substance, easily soluble in water. The amount obtained from 1 c.cm. of egg-white was 0·1 mg., or very nearly 3 mg., to a good-sized hen's egg.

Effect of Reaction of the Medium.—Lysozyme action only takes place when the medium is approximately neutral. When any appreciable quantity of acid or alkali is present the reaction is delayed or abolished. Thus it is delayed when the medium contains as little as 1/8000 normal acid or 1/24,000 normal alkali, and there is complete inhibition when the fluid contains 1/800 normal alkali.

Effect of Heat.—If a lysozyme-containing material such as egg-white, sputum, saliva, or a tissue extract is heated to 75° C. for half an hour, the bacteriolytic action is completely abolished. In tears, which contain very little protein, this amount of heat does not completely destroy the lysozyme, though it enormously reduces it. For complete destruction it is necessary to boil the fluid for a few minutes. Wolff has also shown that it is necessary to boil purified lysozyme for a short time to effect complete destruction.

Filterability of Lysozyme.—If small quantities of lysozyme-containing material are filtered through a porcelain filter the filtrate will contain none of the lytic substance. When larger quantities are filtered the first portion of the filtrate contains no lysozyme, but later the ferment will come through in full strength.

Egg-white, diluted 1 in 50, was filtered through a Berkefeld filter, and each 10 c.cm. of the filtrate was collected separately and tested for lysozyme. There was no lytic power in the first 50 c.cm. to come through, but after 70 c.cm. had been filtered the lysozyme came through to full strength.

Effect of Chemicals on Lysozyme.—The salt content of the fluid is important. Lysis was most rapid when the salt content was about 0·5 per cent. There was marked inhibition in a concentration of 2 per cent., and in 5 per cent. salt solution the lytic action was practically abolished. Fluids such as alcohol and acetone precipitate the lysozyme but do not destroy it, and egg-white has been found to retain its activity after remaining in these fluids for one year. Dr. Allison has investigated the action of certain antiseptics in common use on the bacteriolytic action of secretions. This was done by making up serial

lutions of the antiseptic in normal salt solution d adding to each of these dilutions known volumes lysozyme-containing material and the test coccus, ving one tube without antiseptic as a control. ble IV. indicates the results obtained, and a third lumn has been added for comparison, giving the ncentrations of the antiseptics which are capable inhibiting the growth of bacteria such as staphylocci in blood.

TABLE IV.

Antiseptic.	Concentration inhibiting bacteriolytic action of tears.	Concentration inhibiting growth of staphylococci in blood.
Eusol..	1 in 128	1 in 2
Chloramine T. ..	„ 32,000	„ 320
Iodine	„ 64,000	„ 400
Carbolic acid ..	„ 80	„ 320
Flavine	„ 30,000	„ 30,000

It will be seen from this table that, especially th the halogen group of antiseptics, the anticterial element of the tears (and incidentally of her secretions and tissues) is much more susceptible the antiseptic than is a common pathogenic cterium such as the staphylococcus.

Production of Resistant Strains.

If some lysozyme-containing material be embedded a culture plate and the surface thickly planted th a sensitive microbe, there will appear, after olonged incubation, in the area where at first there as complete inhibition, a certain number of colonies an organism morphologically and culturally identical th the original microbe. Subcultures are more sistant than was the original to the lytic action of e secretions, and not only are they more resistant the particular tissue or secretion in contact with nich they are grown, but they are more resistant all tissues and secretions. Thus a colony which s been grown in the neighbourhood of human ars will have acquired resistance to the lytic action the tears and, at the same time, to the lytic action other human tissues and secretions, egg-white birds and fishes, and vegetable material such as rnip.

The non-specificity of the resistance acquired in this y can readily be shown by taking an agar plate, cutting t a strip of agar across the middle, filling it with melted ar containing some lysozyme-containing material, and en streaking across the plate, at right angles to the ibedded material, bacteria from non-resistant strains of e test coccus and strains which have been made resistant exposure to various tissues or secretions. Whereas the owth of the non-resistant strains stops some distance ay from the embedded material, growth of resistant ains takes place close up to it. The same sort of result obtained whatever material is embedded and whatever the substance to which the strains have been made sistant.

When a microbe has acquired resistance to lysozyme this way it maintains its resistance for some conderable time, and the resistance has been found diminished after the growth has been subcultured out every two or three weeks for nine months. Table V. shows the gradual increase in the resistance lysozyme which can be induced in an organism by owing in gradually increasing concentrations of a sozyme-containing material such as egg-white. It ll be seen from the table that after 91 weeks' journ in egg-white *M. lysodeikticus*, which was iginally soluble in 1 in 64,000 dilution of the eggnite (in three hours), became so resistant that it as only dissolved completely by a 1 in 800 dilution. ith the streptococcus also the dilution of eggnite which caused complete solution in three hours as altered after 67 weeks from 1 in 800 to less an 1 in 5. It has also been shown that these strains nich have been made more resistant to egg-white e more resistant to the bactericidal power of human ood and to intracellular digestion by human ucocytes.

These experiments, then, seem to indicate a method whereby a non-pathogenic or only slightly pathogenic microbe may increase its virulence. This is supported by the work of my colleague Dr. Ridley who, by exposing staphylococci to lysozyme contained in

TABLE V.

Weeks of growth in egg-white broth.	Lysis shown in three hours at 45° C. by egg-white in dilutions as under.											
	M. lysodeikticus.											
	1/800.	1/1,000.	1/1,600.	1/2,000.	1/3,200.	1/4,000.	1/6,400.	1/8,000.	1/12,800.	1/16,000.	1/32,000.	1/64,000.
Before	+	+	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+	+	ac
10	+	+	+	+	+	+	+	+	+	ac		
65	+	+	+	+	+	+	ac	+	±			
91	+	+	ac	+	±	+		±				
	Streptococcus.											
	1/5.	1/10.	1/20.	1/40.	1/80.	1/160.	1/320.	1/640.	1/800.	1/1,600.	1/3,200.	1/6,400.
Before	+	+	+	+	+	+	+	+	+	ac	ac	±
8	+	+	+	+	+	+	ac	±	±			
28	±	ac	ac	ac	ac	ac	ac					
67		?	?									

+ = complete lysis. ± = partial lysis.
ac = almost complete lysis.

tears and cultivating the survivors, has been able to show that these survivors are capable of causing keratitis in a rabbit when injected intracorneally, whereas the original culture was incapable of doing this.

"Absorption" of Lysozyme by Sensitive Bacteria.

The bactericidal substances which exist in blood serum for microbes such as the typhoid bacillus or the cholera vibrio effect a union with the bacteria, so that when the bacteria are removed by centrifugalisation from a serum-bacteria mixture the whole of the bactericidal substances are removed also. Experiments of this kind were done to see whether lysozyme behaved in the same way. The result of these experiments was very surprising; instead of the lysozyme being absorbed by the bacteria and so rendered inactive, its bacteriolytic power was actually increased after the solution of large numbers of microbes.

TABLE VI.—*Showing the Increase of Lytic Power of Tears after Solution of Varying Quantities of* M. Lysodeikticus.

Cocci which had been dissolved by tears.	Amount of lysis observed in dilutions as under of the tears.						
	1/5,000.	1/10,000.	1/20,000.	1/40,000.	1/80,000.	1/160,000.	1/320,000.
0 (control)	+	ac	±	0	0	0	0
0 „	+	ac	±	0	0	0	0
30*	+	ac	±	tr.	0	0	0
300*	+	+	ac	ac	0	0	0
3,000*	+	+	+	ac	±	0	0
30,000*	+	+	+	ac	±	tr.	0

* million per c.cm. tr. = trace.

To measured quantities of tears diluted 1 in 100, graded quantities of *M. lysodeikticus* were added, and the mixtures were incubated at 50° C. for 15 minutes, when lysis of the cocci was complete. The fluids were then titrated for lytic power and compared

with similar volumes of the tear dilution which had not been in contact with the cocci. The results are given in Table VI. It will be seen that after solution of 30,000 million cocci per c.cm. there had been a fourfold increase in the lytic power of the solution of tears.

The fact that bacteria when dissolved by lysozyme do not neutralise the lytic agent doubtless has a very important bearing on the utility of lysozyme in preventing infections.

When we contrast in our minds the powers of the natural "antiseptics" of the body with the chemical antiseptics we are all probably inclined to believe that the former are weak in comparison. Possibly this is because in the past the testing of chemical antiseptics has for the most part been done under conditions which are very favourable to the antiseptic, while the testing of the bactericidal agents normally present in the body has perforce often to be done under conditions unfavourable to them. In the following experiment the natural antiseptic, lysozyme, is compared with the common chemical antiseptics in use, under conditions not unfavourable to the former.

Small discs are cut out of an agar culture plate with a cork-borer, and in the cavities so produced discs of filter paper soaked in natural or chemical antiseptics are placed. The cavities are then filled in with melted agar and the whole surface is planted thickly with bacteria. The natural antiseptics chosen are tears and nasal mucus, both of which are rich in lysozyme, and the microbe chosen is *M. lysodeikticus* which, while it presents about the usual resistance to the chemical antiseptics, is specially susceptible to lysozyme action. There is no growth of the coccus near the embedded tears and nasal mucus, while there is a thick sheet of growth over all the chemical antiseptics—namely, iodine, 1 in 100; carbolic acid, 1 in 20; mercuric chloride, 1 in 1000; flavine, 1 in 1000; brilliant green, 1 in 500; gentian violet, 1 in 100; and mercurochrome, 1 in 100. Such an experiment shows that, given favourable conditions, the natural antiseptics have a far greater antibacterial effect than the commonly used chemical antiseptics in the strengths in which they are employed.

Relation of Lysozyme to Natural Immunity.

It seems hardly likely that the human body should have been endowed with such a powerful antibacterial power unless it were of use. The wide distribution of lysozyme in the cells of the tissues and organs rather suggests that this antibacterial agency is one of the primal protections of the cell against bacterial invasion, while its great concentration in certain tissues and secretions indicates that its elaboration or secretion has become especially enhanced in certain regions which are particularly exposed to infection or which are lacking in other means of protection. The eye, the nose, and the lower respiratory tract are constantly exposed to those organisms commonly met with in the air, and it is towards these organisms that the lysozyme of tears, nasal mucus, and sputum are most powerful. There could be no chance of a microbe such as *M. lysodeikticus* invading the body, as it would be killed and dissolved by the secretions long before it could proliferate and set up an infection.

The use for an efficient bactericidal agency in cartilage is clear, as this tissue is practically without blood-supply, so that if microbes did gain access the bactericidal powers of the blood, which might prove effective in other tissues, would here be without avail. The use of lysozyme in egg-white in enormous concentration is equally clear in that, apart from the mechanical protection of the shell, which is by no means perfect, there is nothing to protect the egg from bacterial invasion.

The very interesting observation was made that human tears had some bactericidal and bacteriolytic power on *Bacillus abortus* and *B. pseudotuberculosis rodentium*, while they apparently had none on *Micrococcus melitensis* and *B. pestis*. It is well known that *B. abortus* is culturally and serologically identical with *M. melitensis*, and the same applies to *B. pseudotuberculosis rodentium* and *B. pestis*. Therefore the two organisms which are not pathogenic for man are destroyed by human secretions, while the two identical organisms which are pathogenic for man are insensitive to these secretions. It may be that th difference in the pathogenicity of these organisn lies in their different susceptibilities to huma lysozyme.

If the organism survives the lysozyme and grow out in its presence, its progeny acquire a resistanc to the lysozyme of all the tissues and secretion including the leucocytes. This acquired resistanc might easily be enhanced until a microbe of pract cally no virulence which has been growing sapr phytically might ultimately become capable infecting the body.

It has not been found possible to increase th lysozyme content of the secretions or of the bloo serum by the administration of vaccines. This is i marked contrast to the well-known bacteriolyt power of the blood serum to organisms like th typhoid bacillus, and it rather suggests that lysozym is related to natural immunity and not to an immunity that may be acquired.

Findlay has shown that in animals fed on a di deficient in vitamin A the onset of keratomalac was coincident with a fall in the lysozyme conte of the tears, and that the onset of keratomalac could be prevented by the instillation of huma tears into the animals' eyes, whereas the instillatio of normal salt solution had no such protective actio Ridley has found that patients with keratitis an conjunctivitis have a reduced lysozyme content i the tears, and that this reduction is sufficient to perm of the growth of organisms like staphylococci, whic are inhibited by tears containing their full complemer of lysozyme.

The view has been very generally held that th function of tears, saliva, sputum, &c., in relation t infections was to rid the body of the microbes b mechanically washing them away. Metchnikoff, his treatise on "Immunity and Infectious Disease expresses himself very clearly and precisely on th point.

"Nature to protect the skin and mucous membran does not use antiseptics. The fluids which bathe t surface of the mouth and other mucous membranes a not bactericidal or very imperfectly so. Nature remov from the mucous membranes and the skin quantities microbes, eliminating them by epithelial desquamati and expelling them with the secretions and liquid excretio Nature has chosen this mechanical procedure just as t surgeons who replace the antisepsis of the mouth, t intestine, and other organs by lavage with physiologic saline."

Such a view must be profoundly modified, and th direct bactericidal action of the tissues and secretio must be considered an important factor in natur immunity.

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THE BIRMINGHAM HOSPITALS.—It is expected th the first year's working of the Birmingham Hospital Saturd Fund, in its capacity as the Industrial Section of the H pitals' Contributory Scheme, will be the raising of ov £140,000—more than double the amount raised in 192 This fund is said to be the largest organisation of the ki in the world. A cot given by workpeople employed at t Austin Motor Works has recently been dedicated in t Children's Hospital, Birmingham. The Austin Workpeopl Hospital and Benevolent Fund has during the last 12 ye contributed £57,000 to the hospital and other charita institutions of the city. Dr. F. W. Ellis, the chief medi officer of the Birmingham Board of Guardians, dealing w the work in the year ending on March 31st last of t Dudley-road and Selly Oak Hospitals, reports that the ci "is at last beginning to get within viewing distance obtaining a sufficient number of hospital beds." More th 21,000 patients were treated, there were nearly 1000 ope tions for appendicitis, and over 1000 cases of pneumon The average weekly cost per head was a few pence over

UTE MENINGO-ENCEPHALOMYELITIS OF CHILDHOOD.

REPORT OF SIX CASES.

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With a Pathological Report on One Case by

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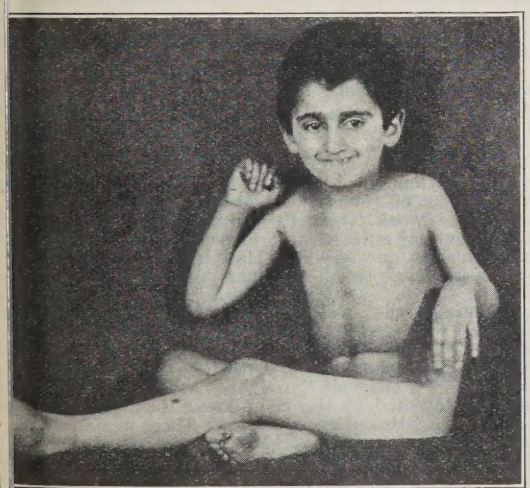
[N June, 1928, we reported in a letter to THE NCET [8] "six cases of acute meningo-encephalo-relitis which differed clinically in many respects m acute epidemic encephalitis lethargica and owed a marked clinical similarity to post-vaccinal cephalitis, though none had recently been vac-ated." This paper contains a full clinical account these cases, together with Prof. Turnbull's report the pathological findings in the fatal case, to which erence has already been made at the Cardiff meeting the British Medical Association.[26]

Report of Cases.

ASE 1.—A. B., male, aged 8 years, Hebrew, who lived at talfields, was admitted to the London Hospital on ril 16th, 1928. On the morning of the day of admission said that he felt "miserable" and complained of a loss eeling in the right hand. In the evening he went to bed usual, but about 8 P.M. he vomited, and was found semi-scious and unable to move his right arm, and was then ught to hospital. The previous history was unimportant ; had been vaccinated in infancy.

ondition on Admission.—On admission the patient was onscious and saliva ran from his lips. His temperature 99·4° F., his pulse 90, and his respiratory rate 32. The

FIG. 1.



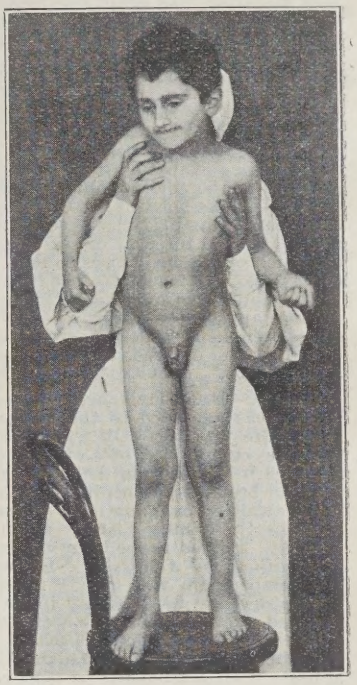
Patient No. 1 during the sixth week of his illness.

fli were normal, the pupils equal, and reacted to light ; te was moderate horizontal conjugate ocular deviation to he left, with a flaccid right hemiplegia. The tendon re xes were brisker on the left side than on the right. The a ominal reflexes were not elicited. The right plantar re x was extensor and the left flexor. There was slight ri dity of the posterior cervical muscles, and Kernig's sign w present. The cerebro-spinal fluid was clear and no c gulum formed. There was one small lymphocyte per c. m., protein 0·073 per cent., sugar 0·077 per cent., chlorides 0·73 per cent. Wassermann reaction negative. The fauces were normal, the cardiovascular system, the lungs, and the abdominal viscera appeared normal. The urine was normal. Blood examination showed a slight leucocytosis, there being 11,480 white cells, with a normal differential leucocyte count.

Progress of Case.—The patient became afebrile on the fifth day of the illness. Consciousness was not fully regained until the seventh day, and complete motor aphasia and apraxia were then found to be present. There was marked trismus, which persisted for a fortnight and rendered feeding difficult. Saliva ran from between the clenched teeth. There was marked weakness of all four limbs, the left being weaker than the right. Some cervical rigidity remained for a fortnight.

Figs. 1 and 2 illustrate the condition of the patient in the sixth week of the illness when he still had complete motor aphasia and double spastic hemiparesis. During the latter part of June speech began to return very gradually, and the patient, who previously throughout the illness had had incontinence of urine and fæces, began to regain sphincter control. Power improved in the limbs. Improvement, once begun, was rapid and by the end of August recovery was almost complete. Speech and intelligence were then normal, and so, too, was voluntary power except for very slight weakness of the lower limbs. There was slight precipitancy of micturition, otherwise there were no residua. (Ref. No. 30597/1928.)

FIG. 2.



Patient No. 1 during the sixth week of his illness.

CASE 2.—C. D., male, aged 9, who lived in Bethnal Green, was admitted to the London Hospital on May 2nd, 1928. On the previous day he went to a cinema and on returning home complained of slight bachache. At 9 P.M. he said he felt "hot and cold," and was put to bed. He vomited once during the night and twice on the next day. During the night movements of the patient's arms were observed which were described by the mother as "jumps, just as if he was going to have a fit." The next day he was very drowsy and the mother stated that she "could not get him to take notice." Previous history : He had measles when 3, scarlet fever when 5, and had never been vaccinated.

Condition on Admission.—On the evening of May 2nd his temperature was 105° F., pulse 140, and respiratory rate 38. He was extremely drowsy. He could be roused to answer questions which were shouted at him, but often fell asleep in the middle of a statement. He was delirious when roused. There was no aphasia. He tended to lie on the left side in an attitude of general flexion. On two occasions he exhibited a spasm of the upper limbs in which the arms were abducted at the shoulders, the elbows and fingers remaining flexed. The eyes were closed and photophobia was extreme, which rendered examination of the fundi impossible at this stage. The pupils were equal and reacted briskly to light ; there was a convergent squint (congenital). Ocular movements could not be tested. Facial movements were rather poor on both sides. The tongue was protruded in the middle line. There was moderate cervical rigidity. The limb musculature was generally hypotonic ; voluntary power was good as far as could be tested. The tendon reflexes in the upper limbs were very sluggish. The knee-jerks were just present and equal, the right ankle-jerk was just present, the left was not obtained. The abdominal reflexes were present in the upper segments only, and brisker on the right side than on the left. The plantar reflexes were flexor. Pin-prick was everywhere appreciated. Kernig's sign was positive. There was no incontinence. No abnormality was found in the fauces,

heart, lungs, or abdomen. The urine contained a trace of albumin. Blood examination was normal.

Lumbar puncture was performed. The cerebro-spinal fluid was clear and colourless and contained one mononuclear cell per c.mm. The protein was 0·047 per cent., the glucose 0·077 per cent., and the chlorides 0·715 per cent.

Progress of Case.—On the following day, May 3rd, he was less drowsy, but still delirious; photophobia was present, but less marked; cervical rigidity was less marked; the condition was otherwise unchanged. The temperature was 104° F. in the morning, falling to 102° F. at night. On May 4th there was again less drowsiness, less photophobia, and less cervical rigidity. Delirium had ceased. The temperature, however, rose to 105° F. at night. After this date improvement was rapid. The temperature after reaching 105° F. on the evening of May 5th fell rapidly and reached 98° F. on the morning of May 7th, and did not again rise above normal. The disappearance of the signs and symptoms of meningeal irritation left the child much exhausted, but convalescence was fairly rapid. The fundi could not be examined in the early stages of the illness on account of the photophobia. Later some swelling of the optic discs was noted. Mr. C. B. Goulden was good enough to examine this patient for us both in the early stages and again after an interval of six months. He considered the condition of the optic discs to be a "pseudo-papillitis" and to have no relationship to the illness.

The child was discharged from hospital on June 20th, having apparently made a complete recovery. He has since been kept under observation as an out-patient, and examination of the nervous system now reveals no abnormality. (Ref. No. 30695/1928.)

CASE 3.—E. F., male, aged 10 years, who lived at Bethnal Green, was admitted to the London Hospital on May 1st, 1928. He was perfectly well until the day of admission, when he complained of a slight headache in the morning. At 11 A.M. he became delirious and unsteady in walking, He was brought to hospital in the afternoon and vomited while awaiting examination. There was nothing of importance in the family history or in the patient's previous history. He had never been vaccinated.

Condition on Admission.—He was pale and looked ill. His temperature was 97·5° F., his pulse-rate 98, and his respiratory rate 24. He lay in an attitude of flexion and resented examination. He was delirious and appeared to think he was being kept at school, and addressed everyone who approached him as "Madam." He had marked nominal aphasia with a tendency to perseveration, and was totally unable to name common objects. He was also apraxic—e.g., retracting the lips when asked to protrude the tongue. There was no cervical rigidity. The fundi were normal; the pupils were equal and reacted well to light and accommodation. The ocular movements were full and there was no squint, ptosis, or nystagmus. There was slight weakness of the lower facial movements on the right side; movements of the soft palate and tongue were normal. No weakness or ataxia of the limbs could be detected; muscle tone appeared to be normal. Pin-prick was everywhere appreciated. The tendon and abdominal reflexes were present and equal. The right plantar reflex was doubtfully extensor, the left flexor. The fauces, cardiovascular system, lungs, and abdomen were normal. The urine was normal. Lumbar puncture was performed within one hour of admission. The cerebro-spinal fluid was clear and colourless. There were no cells. The protein was 0·038 per cent.; the sugar, 0·069 per cent., and the chlorides, 0·73 per cent. The Wassermann reaction was normal. A blood examination showed no abnormality.

Progress of Case.—The effect of lumbar puncture was remarkable. He became much quieter and sank into a quiet sleep. Four hours later he was no longer disorientated and recognised that he was in hospital. On the following day, May 2nd, delirium and dysphasia had completely disappeared. He had no recollection of the episodes of the previous night, did not remember coming to hospital, and did not recognise the doctors who had attended him. The right facial weakness was gone and both plantar reflexes were flexor, but there was now moderate weakness of the left lower facial muscles, which persisted for three days. His temperature on the second day of the illness was 99° F., but after this he was apyrexial. A week after the onset he was apparently completely well and has remained so since. (Ref. No. 30686/1928.)

CASE 4.—G. H., female, aged 8, who lived at Bow, was admitted to the London Hospital under the care of Dr. Cecil Wall on May 5th, 1928. Her illness began three days previously, when she complained of headache, vomited several times, and became lethargic, taking no notice when addressed. There was nothing of importance in the previous or the family history.

Condition on Admission.—The child appeared to be very ill, with a temperature of 105·4° F., a pulse-rate of 160, and respiratory rate of 50. The skin was hot and dry, the tongue furred, and the lips covered with sordes. T patient was very drowsy, but could be roused to answ questions intelligently. There was no dysphasia. T fundi were normal, the pupils were widely dilated a reacted very sluggishly to light and on accommodatio The ocular movements were full. Movements of the fac soft palate, and tongue appeared normal. There was appreciable loss of power in the limbs, which were hypoton The abdominal reflexes were present and equal. The tend reflexes were not obtained; there were bilateral extens plantar responses. Pin-prick was everywhere appreciat There was moderate cervical rigidity and Kernig's si was present. The tonsils were enlarged. The cardi vascular system, the lungs, and the abdomen were norm The urine contained a trace of albumin. Lumbar punctu was performed on the day following admission. The cerebr spinal fluid contained four mononuclear cells per c.mm. T protein content was 0·015 per cent.; the chlorides we 0·73 per cent. The Wassermann reaction was negative.

Progress of Case.—In the first three days after admissi the patient continued to be alternately drowsy and restl and complained of pain in the head and back. T temperature fell by lysis to normal on the fifth day aft admission. An eruption of herpes febrilis appeared on t lips on the second day. Cervical rigidity persisted three days. On the fifth day the patient was much bett and was no longer drowsy. The pupillary reactions we still very sluggish, but the plantar reflexes were flex Recovery was rapid and complete. When re-examined Dec. 16th, 1928, the child was said to be in normal heal and attending school. Examination failed to reveal a abnormality in the nervous system or elsewhere. (R No. 40722/1928.)

CASE 5.—I. J., female, aged 18, who lived at Shepher Bush, was admitted to the Hospital for Epilepsy a Paralysis, Maida Vale, on June 4th, 1928. On May 28 she swam in some open-air baths in the morning. In t evening she felt sick, giddy, and faint. Frontal headac and vomiting developed. On the following day the headac was more severe and she saw Dr. J. M. Fonseca, who h kindly furnished us with information as to her conditi at that time. She was found to have pharyngitis, and h temperature was 103° F. That evening she was deliric and complained of abdominal pain. On the following d she was less feverish and no longer delirious, but there w still pain in the abdomen, and, in addition, in the ba On the fourth day of the illness the temperature was norn and she was free from headache. On the fifth day s attempted to get up, but found the legs were very wea She could only walk with great difficulty and "shuffl along." She had an abnormal feeling in the abdomen, " if she had no stomach." There was no impairment sphincter control. She had been vaccinated in infancy a had scarlet fever and measles as a child. Previous to t illness her general health had been excellent. There w nothing of importance in the family history.

Condition on Admission.—On examination on the sever day of the illness she was a well-nourished girl—brig intelligent, and in no way lethargic. She was apyrexi The fundi were normal, and the only abnormality in t cranial nerves was that the pupils, which were moderat dilated, reacted briskly to light, but failed to react accommodation. The upper limbs were normal. There w no weakness of the abdominal musculature. Both lov limbs were weak, the left slightly more than the rig The abdominal reflexes were present on the right side, almost absent on the left. The tendon-jerks in the lov limbs were exaggerated, the right knee-jerk brisker than the left, the left ankle-jerk brisker than the right. T right plantar reflex was flexor, the left a doubtful extens Sensation: There was hypalgesia to pin-prick on the ri side of the trunk from the level of the third rib to groin and below both knees, but prick was better appreciat on the left leg than on the right. A hot test-tube felt l hot when applied to the right lower limb below the k than when applied above the knee. There was no cutane anæsthesia, no loss of postural sensibility, nor of appreciat of vibration. The fauces were somewhat inflamed, cardiovascular system, the lungs, and the abdominal visc appeared normal. The urine was normal. Lumbar punct was performed on the seventh day of the illness, the day admission to hospital. The cerebro-spinal fluid was cl and colourless. The total protein was 0·030 per cen Nonne-Apelt negative. One cell per c.mm. Lange norm Wassermann reaction negative. The blood Wasserma reaction was negative.

Progress of Case.—Improvement was rapid. Three we after the onset of the illness all sensory loss, and concurren the abnormal sensations referred to the abdomen, l disappeared. There was considerable increase in volunt power in the lower limbs. There was still, however, v little reaction of the pupils to accommodation, though light reflex was brisk. The patient was discharged fr

spital a month after admission and has since been kept der observation as an out-patient.

When last seen, Dec. 3rd, 1928, she had no symptoms, d returned to work, and was able to stand all day without igue. The reaction of the pupils to accommodation was ll somewhat sluggish, the abdominal reflexes were minished on the left side as compared with the right, and ere was slight weakness of the left lower limb. The knee- d ankle-jerks were brisker on the left than on the right le and the left plantar reflex was less briskly flexor than e right. There was no sensory loss.

CASE 6.—K. L., male, aged 3, who lived at Woodford, sex, was admitted to the London Hospital under the care Dr. Cecil Wall on May 5th, 1928. Dr. D. W. Tacey, der whose care he was prior to his admission, has kindly t us the following information as to his previous condition. . Tacey first saw the patient on May 3rd, when the relatives ted that the child had been restless for two days and ghts, had vomited occasionally, and had lost its appetite. e child looked listless and "seedy," but not very ill. e temperature was normal, the respiration rapid, but not oured. Physical examination revealed nothing abnormal cept some faucial congestion and a furred tongue. On e following day, May 4th, the child seemed brighter. The nperature was normal, but the respiration was still rapid. May 5th he was much worse, having passed a restless ght, screaming suddenly and vomiting. When examined Dr. Tacey he was very lethargic and difficult to rouse, ng curled up in a flexed attitude. He screamed if touched on the right side, but did not mind being touched on the t side. There was no head retraction, but Kernig's sign s present. Tache cérébrale was elicited on the chest and domen. Respiration was very rapid and laboured. The ild was then admitted to the London Hospital. Previous story: Vaccinated in infancy.

Condition on Admission.—On admission he was semi- nscious and resented interference. The temperature was 1° F., the pulse 128, and the respiratory rate 46. He lay his side with the head somewhat retracted and the limbs xed. There was slight rigidity of the posterior cervical uscles and Kernig's sign was present. The fundi were rmal, the pupils moderately dilated and equal, and reacted light. There was no squint. No gross weakness of the abs could be detected. The knee-jerks were present and ual and the plantar reflexes indefinite. The heart, lungs, d abdomen were normal. The cerebro-spinal fluid was ear and no coagulum formed. It contained seven cells per mm., type monocytes. The protein was 0·030 per cent., d the Wassermann reaction was negative.

Progress of Case.—The child became increasingly comatose d died on the day following admission.

The following is Prof. H. M. Turnbull's report on the result the post-mortem examination. (Ref. No. 30720/1928.)

REPORT ON POST-MORTEM FINDINGS IN CASE 6, BY PROF. H. M. TURNBULL.

Summary (P.M. 205, 1928).—Toxæmia. Ring emorrhages in congested and œdematous brain. ipoid nephrosis of kidneys. Extreme fatty, partly poid, degeneration of liver. Parenchymatous generation of myocardium. Central necroses in alpighian bodies of spleen. Congestion of posterior rts of lungs. Slight mucous catarrh of stomach. jection of Peyer's patches. Group of caseous tuber- ulous mesenteric glands (largest 1·3 × 0·8 × 0·7 cm.) lower and middle tiers of mesentery and in ileo-colic gle. No atheroma. Straight line, less than half a illimetre deep, of provisional calcification in ribs and mur. Red marrow throughout femur. Slightly asted, well-developed boy with sunken eyes.

Weights: Body, 11·3 kg. (length 0·915 metre); rain, 1162·3 g.; liver, 375·8 g.; heart, 56·7 g.; dneys, 85·0 g.; spleen, 14·2 g.; thymus, 10·2 g.; yroid, 1·9 g.; pancreas, 16·1 g.; suprarenal bodies, 5 g.; pituitary body, 0·2 g.; bodies of testicles, 4 g.

Macroscopic Examination.

The brain was bulky and showed a pressure cone cm. long. The leptomeninges were injected. On ction the cortex was a deep purple, whilst blood elled from the vessels in the medulla. The kidneys ere enlarged and swollen. The capsule was thin and sily removed from a smooth, pale, yellowish outer rface. The cortex bulged above the medulla, and owed somewhat opaque yellow vertical streaks in e intermediate zone. The liver showed the general nlargement, the rounding of borders and the swelling of the cut surface characteristic of parenchymatous degeneration.

Microscopic Examination.

Portions of the liver, kidney, and spleen were fixed in 4 per cent. saline formaldehyde and embedded in paraffin. Other portions of the liver and kidney after similar fixation were cut upon the freezing microtome; some sections were stained by Herxheimer's method and others were mounted unstained in glycerine jelly for examination with the polariscope. The brain and cord were first fixed in 4 per cent. saline formaldehyde. Numerous pieces were then taken from the frontal, parietal, and occipital lobes, the Sylvian fissures, the centra semiovalia, and the cerebellum; numerous complete segments were taken from the basal ganglia, the anterior and posterior part of the midbrain, the pons, medulla oblongata, and all divisions of the spinal cord. One series was cut upon the freezing microtome, and sections were stained by Herxheimer's method. Another series was embedded in paraffin, and sections were stained with toluidin-blue according to Lenhossek's method, Mallory's phosphotungstic hæmatoxylin after treatment with Zenker's fluid, Ehrlich's hæmatoxylin and eosin, Weigert's iron hæmatoxylin, and van Gieson's stain, Weigert's fuchselin and neutral red, and muci-carmine and hæmatoxylin. Other two series were placed in Müller's fluid and were stained respectively by the Busch-Marchi method after embedding in celloidin, and by the Weigert-Pal method after embedding in paraffin.

Kidney.—The kidney is congested. Most of the cells lining the first convoluted tubules, including the straight portions, are loaded with fatty granules and crystals, which after melting give doubly refractive liquid crystals under the polariscope; the remaining cells show severe albuminous degeneration. In many cells there is karyolysis or complete loss of nuclei. The lumina of the first convoluted tubules contain albuminous granules, a very few desquamated epithelial cells, and a few fatty spheres; there are also one or two red corpuscles in a few lumina, possibly carried there by the knife. A few minute granules of fatty substance are present in some of the cells lining the ascending limbs of the loops of Henle. Hyaline droplet degeneration is not present. There are no casts in the ascending limbs of Henle, nor in the collecting and discharging tubules. In the glomeruli the capsule of Bowman sometimes contains albuminous granules, which appear to be due, at any rate in part, to necrosis following swelling and desquamation of cells of the epithelial lining. Occasionally a glomerular lobe devoid of epithelium is united by albuminous granules to a portion of the parietal wall of the capsule devoid also of epithelium, indicating the commencement of glomerular adhesion. Glomerular necrosis, proliferative glomerulitis, and proliferative capsulitis are absent. There is no inflammatory infiltration of tubules or interstitial tissue.

Liver.—The cells throughout the lobules are loaded with fatty substance. In the outer third to one-half of the lobules the cells are converted by large globules into signet rings; in the inner part of the lobules the cells contain granules as well as large globules of fat. The Kupffer cells also contain fat. After melting the fat a considerable number of doubly refractile liquid crystals are formed. In the hepatic cells in the centres of the lobules the nuclei are frequently very small, pale, and of irregular shape; in some cells the nucleus is absent.

Spleen.—The centres of the Malpighian bodies are occupied by large, swollen, polygonal reticulum cells; in some Malpighian bodies a few of these are necrosed. The reticular strands of the pulp contain few free cells; eosinophil leucocytes are scattered throughout, and there are a very few large basophil monocytes undergoing karyokinesis. The venous capillaries show some desquamation of endothelium, and contain more lymphocytes than granular cells; neutrophil leucocytes are present in considerable number in a few areas only, and there are a few myelocytes. The intima of some of the arterioles shows hyaline degeneration.

Central Nervous System.—Œdema of the central nervous system is shown by wide perivascular spaces of His, by wide perineuronal spaces, and by a reticular rarefaction of the tissues round many vessels. The

meninges are conspicuously engorged and there is great *engorgement* of the substance of the brain and brain-stem, and less engorgement of the spinal cord. The red corpuscles within the central nervous system have with few exceptions been laked. *Hæmorrhages* into the perivascular space of His, less commonly into the adventitial space, are present in small number in the white matter of the cerebrum, the cerebellum, and the pons. Ring hæmorrhages are frequent in all parts of the centra semiovalia and the white matter of the cerebellum; in these sites they are usually of small size. In the internal capsules, particularly the left, they are more numerous and larger; in the anterior commissure they are very numerous and of great size.

In the centre of the *ring hæmorrhages* is a capillary or small vein. The lumen contains closely packed red corpuscles and, occasionally, a considerable number of neutrophil leucocytes. Hyaline thrombi, which are usually present within ring hæmorrhages, appear to be absent from this case; no fibrin was demonstrated by the Weigert-Gram method. Round the vessel is a zone containing conspicuous spherical, pyriform, and, less commonly, cylindrical bodies. The larger bodies measure as much as nine micra in diameter. In hæmatoxylin and van Gieson preparations these bodies are hyaline. In Mallory's phospho-tungstic hæmatoxylin they frequently show numerous small blue dots, of one to one and a half micra in diameter, closely packed in a pinkish-yellow matrix; this appearance thus suggests a spore-bearing body. Comparison of the appearances in all stains shows that these bodies are focal swellings of axis-cylinders surrounded by a thin ballooned medullary sheath. In this central zone there are usually several neutrophil leucocytes, large mononuclear leucocytes, and glial cells which have a sharply defined body and, usually, a large, pale nucleus. Outside this zone of swollen axis-cylinders is a zone in which the tissues are separated by laked red corpuscles. In this zone glial cells and nuclei are relatively scanty; one or two neutrophil leucocytes are sometimes present. No fibrin is demonstrated by the Weigert-Gram method within the ring hæmorrhages, and no fat by either Herxheimer's or Marchi's methods.

In the sections stained by Lenhossek's method the *bodies of the neurons* and their neurochromatin show in general remarkably little alteration, considering that the material was not fixed until some 32 hours after death. In certain nuclei, however, there are obvious degenerative changes. In the dorsal vago-accessory nucleus there is perinuclear tigrolysis, several nuclei are eccentric, and a few cells have lost their nucleoli. In the dorso-lateral part of the oculo-motor nucleus, particularly at the level of the posterior corpora quadrigemina, the tigrolysis is greater, and eccentricity of nuclei and loss of nucleoli are frequent. Similar changes are seen in the large cells of the putamen and globus pallidus. On the left side the degeneration is very severe in the external division of the globus pallidus, some cells having lost their nuclei; it is less severe in the mesial division and still less in the putamen. On the right side the degeneration is not so great, and a similar difference between the degrees of affection of the three nuclei is doubtful.

In sections stained by the methods of Herxheimer and Marchi fine droplets of fat are demonstrated within a few endothelial cells lining vessels. *Fat-granule cells* are numerous. They are of swollen fusiform or more often rounded shape, and are filled with coarse granules of fatty substance. They clothe the outer surface of capillaries and venules, and lie clearly within the adventitial sheath of larger vessels. A very few lie in the pia within cerebral sulci. They are present in small number round a few vessels within the cerebral cortex, being most numerous in the deeper layers. In the cerebral white matter they are numerous and conspicuous round many of the vessels in the centre of the convolutions and become less numerous deeper within the centra semiovalia. They are present throughout the basal ganglia, but are sparse except in the vessels between the two division of the globus pallidus, vessels in the internal capsule and putamen, and in the optic thalamus near the internal capsule. They are also present throughout the midbrain, but are numerous only in the adventitia of many large vessels in the crusta, large vessels beneath the lateral fillet, and smaller vessels in the grey matter round the iter. In the pons they are conspicuous round vessels close to the ventricular surface, in the nucleus funiculus teres and in the ventro-lateral angle of the fourth ventricle. In the cerebellum they surround a few vessels immediately beneath the cortex and several vessels deep within the white matter. In the medulla oblongata they are very scanty and in the spinal cord are found in very small number in the white matter of the cervical segments alone. They are also present round a few vessels in the optic tracts.

Free Fat.—In Herxheimer, Sudan, and Marchi preparations numerous extra-cellular fatty globules are seen in the external segment of the globus pallidus on both sides, being more abundant in the dorsal two-thirds of the nucleus; similar, but much less numerous, droplets lie in the mesial segment of the globus pallidus. The droplets measure up to 15 micra in diameter, and are almost always in close relation to white fibres. A few small groups of similar droplets lie in the optic tracts. Fine droplets of fat are demonstrated in small number by the Marchi method alone in the internal capsules, the white matter of the midbrain, particularly the lateral fillets, and in the posterior spinal roots; and in still smaller number in the white matter of the pons, medulla, and spinal cord, and in the anterior spinal roots and the roots of the fourth and fifth cranial nerves. No demyelination is recognisable in the Weigert-Pal preparations. There is no mucous degeneration. Apart from the fat-granule cells there is no infiltration of the adventitia of vessels or of the meninges.

Interpretation of Microscopic Findings.

Fat-granule cells occur normally during the development of the medullary sheaths (Flechsig, 1876; Storch, 1900). Observation was, therefore, kept in the post-mortem room for another child of three years to serve as a control. A girl who had died from acute rheumatic endocarditis and acute and chronic pericarditis (P.M. 373, 1928) was obtained. In Herxheimer preparations of the cerebrum and basal ganglia perivascular fat-granule cells were found in very similar number and distribution. It is impossible, therefore, to accept the fat-granule cells in the case under discussion as evidence of a pathological condition or, at any rate, of a specific pathological condition.

In the examination of the central nervous system of a rabbit which died three days after intracerebral inoculation with vaccinal lymph by Prof. J. McIntosh I had found no evidence of demyelination in Weigert-Pal and Marchi preparations except in the mesial divisions of the ventro-lateral limbs of the lenticular nuclei. Here numerous fat droplets were demonstrated by the Marchi method. Infiltration of the adventitial sheaths of perforating vessels with lymphocytes and large mononuclear leucocytes extended from the cerebrum to the sacral cord. The finding in this rabbit and the young child of free fat confined to the lenticular nucleus suggested that destruction of myelin might occur in the lenticular nucleus in any acute infection, at any rate in young children. The brain of the child of three years who died in an attack of acute rheumatic fever was employed to test this possibility. Numerous large droplets of fat were again demonstrated by Herxheimer's method in the external division of the globus pallidus, and a few in the mesial division. The control material examined is much too scanty for any general conclusion; it is possible that free fat is normally present in the globus pallidus of 3 year old children, but material to test this was not available. The control is sufficient, however, to make it impossible to accept the degeneration seen in the globus pallidus as evidence of a specific pathological change

n the present case. The distribution of intra- and xtra-cellular fat, as demonstrated by Herxheimer's nethod, is the same in both the children aged 3 years.

The specific changes in the central nervous system re thus reduced to œdema, congestion, degeneration f certain groups of ganglion cells, and ring hæmorhages. The ring hæmorrhages, when compared with hose associated with fat embolism, broncho-neumonia, cerebral hæmorrhage, and eclamptic æmorrhage in specimens which have been reserved n our cabinets, differ in the apparent absence of hrombi in the central vessels and in the much greater welling of the axis-cylinders. The swelling of the axis-ylinders approaches to that which was found in an xample of Salvarsan Kopf-Tod. Here, in association vith ring or other hæmorrhages, often independently f hæmorrhage, there are throughout the central ervous system numerous focal areas of astonishingly reat swelling of axis-cylinders and ballooning of their nedullary sheaths; hyaline thrombi are usually resent. The ring hæmorrhages in the present case an be attributed to some toxæmia. A toxæmia vould also explain the degeneration of the bodies of neurons in the sites specified.

It remains to discuss the relation of the changes in he central nervous system to those in the liver and idneys. The size and distribution of the globules of at and lipoid in the liver resemble those of fatty nfiltration rather than of fatty degeneration, as they re usually distinguished. But in young children the lassical morphological characteristics of fatty infil-ration may be found under circumstances which learly show that the metabolism of fat in the liver as been interfered with, so that the accumulation is n expression of degeneration in the sense of a isturbance of function; thus there is frequently reat fatty infiltration of the liver in infants who have een greatly wasted by chronic gastro-enteritis. Further, in the present case there is definite evidence f degeneration of cells in the centres of the lobules. The liver is evidently the site of a parenchymatous legeneration very similar to that in the kidney. In the kidney there is a lipoid and albuminous degenera-ion which is not accompanied by any exudative or nfiltrative inflammatory reaction. The condition is a pure parenchymatous degeneration; that is, a nephrosis in the strict sense of the term as defined by its inventor, Friedrich Müller (1905). Now hæmor-rhages in the brain undoubtedly occur in cases of nephritis with uræmia. In the present case, however, there can be no question of uræmia. Dr. Dorothy Russell, in an investigation of nephritis shortly to be published, has found that evidence of nitrogen retention was obtained by the appropriate tests in the wards in no case in which the kidney showed a similar lipoid nephrosis; further, no evidence of nitrogen retention was found in kidneys in which either a slight cellular infiltration of tubules and interstitial tissue or an interstitial granulation tissue was added to the changes already described. In all examples of such lipoid nephrosis and the corresponding form of nephritis, a form of nephritis which is characterised chiefly by the absence of proliferative glomerular changes, the condition found clinically was one of hydropigenous nephritis alone. In the present example there was not even œdema. There appears, therefore, to be no justification for considering the changes in the brain and liver in this case to be secondary to the changes in the kidney. It is much more likely that the changes in all three organs were caused by a single agent. The cause of lipoid nephrosis and the corresponding kind of nephritis is obscure. Munk (1916) considered syphilis to be a cause. We have had an example of lipoid nephrosis in a man of 47 who had had a primary sore 16 months before the onset of anasarca; but he had received 15 injections of novarsenobillon, and the degeneration may have been due to this drug. Dr. Russell has found that this class of nephrosis and nephritis does not occur in association with recognisable bacterial infections, but that very similar renal changes are associated with certain endogenous and exogenous toxins; this class of nephritis appears to be caused by toxins other than bacterial. In this connexion it may be mentioned that the histological examination of the spleen in the present case showed no evidence of bacterial infection.

For these reasons the changes in the brain, liver, and kidney have been ascribed in the summary of the necropsy to some unknown toxæmia.

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Discussion Resumed by Drs. Brain and Hunter.

Animal Inoculation Experiments.—Dr. S. Phillips Bedson kindly carried out animal inoculations with material obtained from five of our six patients. These experiments and their results are tabulated as follows:—

Case.	Material examined.	Date collection in 1928.	Cultural examination.	Animals inoc.	Mode of inoc.	Result.
1	C.S.F.	25/4	S.	1 rabbit	1·5 c.cm. I.c.	Neg.
				1 monkey†	1·0 c.cm. I.c. and 4·0 c.cm. I.p.	
2	„	2/5	S.	1 rabbit	1·5 c.cm. I.c. and 5·0 c.cm. I.v.	Neg.
				1 monkey†	1·0 c.cm. I.c. and 3·0 c.cm. I.p.	
3	„	1/5	S.	1 rabbit	1·5 c.cm. I.c. and 3·0 c.cm. I.v.	Neg.
4	„	6/5	S.	1 rabbit	1·5 c.cm. I.c.	Neg.
6	Cerv. and dorsal cord.	7/5*	S.		10% emulsion of cord in M/50 phosp. pH, 7·6 :—	
				2 rabbits	1·5 c.cm. I.c.	
				1 rabbit	Inoc. cutaneously, I.d. and corneally.	
				1 monkey‡	1·5 c.cm. I.c. and 5·0 I.p.	Neg.

Cerv. = cervical. S. = Sterile. I.c. = intracerebrally. I.p. = intraperitoneally. I.v. = Intravenously. I.d. = Intradermally.
* Stored in 50 per cent. glycerol in ice-chest until 29/5/28.
† African bonnet. ‡ *M. rhesus.*

Test of Neutralising Power of Convalescent Serum for Herpes Virus.

Case.	Date of bleeding.	—
1	24/5/28	Serum diluted 1 in 5 neutralised 50 M.I.D. herpes virus.
		Serum diluted 1 in 10 did not completely neutralise 50 M.I.D. herpes virus.
2	„	Serum diluted 1 in 1 almost completely neutralised 50 M.I.D. herpes virus.
		Serum diluted 1 in 5 gave no neutralisation.

Results entirely comparable with those obtained with normal lumbar serum.

Summary of Clinical Features.

It will be useful at this point to summarise the clinical features presented by our patients. Six patients came under our observation ranging in age from 3 to 18. All six patients developed their symptoms within a period of six weeks, the first on April 16th, 1928, the next three cases on May 1st, another on May 2nd, and the last on May 28th. Four patients thus manifested their first symptoms during the 48 hours of May 1st and 2nd. Two of these lived at Bethnal Green, one at Bow, and one at Woodford, Essex. The first patient lived at Spitalfields and the sixth at Shepherd's Bush. All thus lived within the London area and all save one in East London. The coincidence of time and, with the exception of the last patient, of place justifies us, we believe, in regarding our six cases as part of a small

epidemic, in which it is likely there were other cases which did not come under our observation.

The onset in every case was acute. Pyrexia was present in every case, and in two patients the temperature reached 105° F. The course of the illness was unlike that of any acute disease of the nervous system with which we are familiar in that, with the exception of the patient that died, all have made a complete or practically complete recovery, and this has occurred in spite of marked variations in the severity and duration of the illness. No. 3 might almost be described as an abortive case since he showed marked improvement a few hours after the onset and was well in four days. No. 2, in whom the symptoms were purely "meningeal" and who showed no signs of involvement of the neuraxis, recovered in a fortnight. No. 4, who showed a predominance of "meningeal" symptoms with the addition of loss of the reflex contraction of the pupils to accommodation and bilateral extensor plantar responses, also recovered in about a fortnight. In No. 5 the predominant symptom was a myelitis with the addition of abolition of the reaction of the pupils to accommodation. This patient recovered from the general symptoms in four days, and the power in the lower limbs had returned almost to normal in a month, but after six months, though subjectively normal, she still showed slight signs of her lesions. No. 1 was the most severely affected of the five surviving patients. In his case "meningeal" signs were insignificant compared with the extensive involvement of the cerebral hemispheres leading to complete aphasia and double hemiplegia. His recovery took several months, but it has been as complete as in the mildest case, and his speech and voluntary power are now normal.

It will be noted that while cervical rigidity and Kernig's sign are almost constant the main variation is in the extent to which involvement of the neuraxis occurs, and this is the main factor in determining the rate of recovery. Two patients showed evidence of extension of the morbid process to an intact area of the nervous system while improvement was occurring in the region first attacked.

Diagnosis from Encephalitis Lethargica.

Our patients differed in many respects from patients suffering from encephalitis lethargica. They presented a number of symptoms very rare in that disease, while several of its more common manifestations were lacking. A fulminating onset, cervical rigidity, Kernig's sign, and trismus are rarely to be found in encephalitis lethargica, and aphasia and hemiplegia are almost equally uncommon. On the other hand, none of our patients showed paresis of individual ocular muscles, and only one-third exhibited pupillary abnormalities. The completeness and in most cases the rapidity of our patients' recovery is unfortunately almost unknown in encephalitis lethargica. Six months is too short an interval to justify stress being laid upon the absence of sequelæ, but we may justifiably emphasise that none of our patients has exhibited that aftermath of invalidism which so frequently follows the acute stage of lethargic encephalitis. Lack of space prevents us from discussing the differential diagnosis from other acute diseases involving the nervous system.

Conditions Presenting Points of Clinical Similarity.

Post-vaccinal Encephalitis.—The clinical resemblance between our group of cases and the numerous reported cases of post-vaccinal encephalitis is striking. Common to both conditions is the rapid onset, with headache, vomiting, drowsiness, and fever, and the frequent occurrence of meningeal symptoms. In either, patients may exhibit convulsions, flaccid paralysis of the limbs, and trismus. Ocular abnormalities are inconstant in both. The variability of the clinical picture—e.g., the occurrence of both encephalitic and myelitic forms—is also characteristic of both, and so too is the tendency to complete recovery of patients who survive.

Trismus is such an unusual symptom of any form of encephalitis that its occurrence in our patient No. 1 appears deserving of emphasis. It has been observed in post-vaccinal encephalitis by Lucksch,[10] Wiersma,[21] and a number of other workers, and is mentioned several times in the clinical accounts of the cases included in the report of the Committee on Vaccination.[20] More than one case of post-vaccinal encephalitis has on account of this symptom been mistakenly diagnosed as tetanus.

Encephalitis Complicating the Specific Fevers.—Many reported cases of encephalitis complicating the specific fevers, especially measles, chicken-pox, and scarlet fever, resemble our patients in their clinical features. These are too numerous to mention individually. We may note in passing that Winnicott and Gibbs [23] quote a fatal case of post-varicellar encephalitis in which meningeal signs and trismus were present, and these authors emphasise the absence of residua in non-fatal cases. Symonds [24] also recently reported a fatal case of encephalitis complicating measles in which trismus was present.

Acute Disseminated Encephalomyelitis.—Under this title a number of conditions characterised by various pathological pictures have been described. Recently Redlich,[19] Pette,[18] Montzka,[14] and Martin [13] have reported cases presenting clinical similarities to our own, and also characterised by their tendency to complete recovery.

Unclassified Forms of Acute Encephalomyelitis in Children.—From time to time observers have reported acute illnesses involving the central nervous system in children and often occurring in small epidemics. These present many points of clinical similarity to our patients, though in several epidemics the mortality has been high. Marsh [12] in 1910 described four cases of "acute non-suppurative encephalitis in children." M. H. Gordon [5] reported 12 cases, all fatal, most of which occurred in the summer of 1913. Anderson,[1] and Brown and Symmers [2] observed between them 16 cases in the United States in the summers of 1923 and 1924. Grinker and Stone[7] have recently described 13 cases of acute toxic encephalitis in childhood complicating local or generalised pyogenic infection.

The Strümpell-Leichtenstern Form of Encephalitis.—The condition to which Strümpell in 1884 and later Leichtenstern first drew attention has since undergone several vicissitudes of interpretation. Strümpell described an acute encephalitis of childhood characterised, in addition to the general symptoms of encephalitis, by convulsions and hemiplegia. This was at first believed to be due to the virus of poliomyelitis, but later came to be regarded as a form of "acute hæmorrhagic encephalitis." Since it appears that the clinical picture of "Strümpell-Leichtenstern encephalitis" may be associated with a number of different pathological states, it is probably best regarded as a clinical syndrome only. Such a syndrome did not occur in our series of cases, though it has been described in such allied conditions as the "acute serous encephalitis" of Brown and Symmers.

The Association of Disturbance of Renal Function with Encephalitis.

Since, in the fatal case in our series, lipoid degeneration of the kidneys was associated with acute degenerative changes in the brain, it is interesting to note that disturbance of renal function has previously been reported in association with acute encephalitis by Ironside and Hinds Howell,[9] M. B. Gordon,[4] and Anderson, and is described by Oppenheim.[16] A similar association of peculiar interest was found by Russell and Oddie [21] in a patient dying of post-vaccinal encephalitis.

Pathological Considerations.

In spite of the clinical similarity of the conditions just described their pathological basis appears at first sight to show considerable diversity. Three groups may in fact be distinguished, though as their distinction is based upon comparatively gross and superficial

aracteristics, it is unlikely that it corresponds to ıy true difference between the pathological processes work. Thus we find:

1. Cases characterised by acute degeneration of the ınglion cells of the brain with hyperæmia and often arked œdema, but without macroscopic hæmor-ıages. This group includes the cases described by ordon, Brown and Symmers, and Grinker and Stone. ussell and Oddie's case of post-vaccinal encephalitis ıould probably also be placed in this group though ıe appearance of the ganglion cells is not mentioned.

2. Cases in which the conspicuous feature is ultiple macroscopic hæmorrhages, so-called "acute æmorrhagic encephalitis." This group includes cases encephalitis following scarlet fever,[23 25] measles,[26 29] fluenza, pyogenic infection,[3 22] and cases occurring ithout any obvious predisposing cause.

3. Cases characterised by perivascular demyelina-on. This histological feature has now been observed a wide range of conditions, including post-vaccinal ncephalitis,[26 27] encephalitis complicating measles,[6 30] ariola,[11] paralysis arising during antirabic treatment,[26] ıd acute disseminated encephalomyelitis.[19]

It is probable that there is no essential pathological ifference between groups 1 and 2, the cerebral ıanifestations in both being the response to a ɔxæmia, which varies in its effect upon nerve-cells ıd blood-vessels, so producing varying degrees of ædema and hæmorrhage. These groups include the ases with renal damage, and our cases would seem to elong to them. Whether any relationship will be stablished between the first two groups and the cases ıowing perivascular demyelination remains to be een, but it is noteworthy that some cases of ence-halitis complicating measles have shown this feature, hile others have been examples of "acute hæmor-ıagic encephalitis."

It may be questioned whether encephalomyelitis is ıe right term to apply to a group of cases in which he cerebral symptoms are the result of a toxæmia ıd which present no histological evidence of inflam-ıatory reaction in the nervous tissues. It seems kely that with further knowledge the existence of ıch states will be recognised by appropriate termino-ɔgy. For the present, however, it seems best in view f their clinical affinities to retain the term encephalo-ıyelitis for these cases.

Conclusions.

Since no satisfactory pathological or bacteriological lassification of certain acute forms of encephalitis is t present available, we feel justified in emphasising linical points of similarity. Our cases appear to show hat a clinical picture similar to that of encephalitis ollowing vaccination, measles, and other specific evers may occur in the absence of any recognisable redisposing cause. A scientific classification of these orms of encephalomyelitis can only be soundly based ıpon much greater knowledge—clinical, pathological, ıd bacteriological—than we yet possess.

We are indebted to Prof. Turnbull for the time and onsideration he has given to the pathological changes n Case 6; to Dr. S. Phillips Bedson for carrying out ınimal inoculation experiments; to Dr. Cecil Wall for llowing us to include Cases Nos. 4 and 6; to Mr. . B. Goulden, for examining patient No. 2; to Drs. E. G. Frewer and L. Hartston, house physicians to the London Hospital; and Dr. C. E. Woodrow, resident nedical officer to the Hospital for Epilepsy and Paralysis, Maida Vale, for their valuable coöperation n the observation of our patients; and to Dr. Tacey ınd Dr. Fonseca for placing at our disposal their notes ɔn their patients.

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(*Continued at foot of next column.*)

PEMPHIGUS NEONATORUM.

A SERIES OF FIFTY CASES.

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ALTHOUGH this disease was described as long ago as 1773 as a separate infection affecting infants, there does not appear to have been any serious epidemic in this country for a long period. During recent years, however, there has been a very considerable increase in the number of cases arising in many different areas throughout the country. The Central Midwives Board, indeed, thought fit last year to issue to all midwives a special pamphlet,[1] illustrated with a coloured plate, pointing out the main characteristics of the rash and the infection. The literature upon the subject appears to be comparatively scanty and fragmentary. It is this fact which has led us to record our investigations and observations upon the cases dealt with in this paper, though the numbers involved are not very great. Out of 50 cases, five ended fatally (i.e., a mortality of 10 per cent.).

This disease, which occurs in newly born infants, is characterised by the appearance on the body of watery blisters, round or ovoid in shape and in some cases associated with severe toxic symptoms. It is distinct from the syphilitic pemphigus of infants, in which the rash appears at a later date and is always accompanied by other signs and symptoms of congenital syphilis. During 1927, and up till the end of September, 1928, we have investigated 50 cases which occurred in a borough with a population of 315,400. This year there have been 24 cases, the remaining 26 cases having arisen in 1927. Pemphigus neonatorum is not a notifiable disease; the infants in this series have been certified as suffering from pemphigus or "watery blisters," and came to our notice through being reported to the local supervising authority by the midwives in attendance, according to the rules of the Central Midwives Board. All the cases, except two,

(*Continued from previous column.*)

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occurred in a district which is poor and overcrowded, and where home conditions are very unsatisfactory. The majority developed in homes where the families lived in three rooms or less, and where overcrowding was prevalent. Four of the babies were delivered by a doctor, 45 by a midwife, and one in an institution (Table I.).

TABLE I.—*Illustrating Distribution of Cases among the Various Attendants, and the Termination.*

Attendant at birth.	Cases	Result.		Attendant at birth.	Cases	Result.	
		R.	D.			R.	D.
Dr. A.	3	2	1	Midwife E ..	4	4	—
Dr. B.	1	1	—	,, F ..	1	1	—
Midwives A* ..	15	13	2	In institution ..	1	1	—
Midwife B ..	15	14	1				
,, C ..	9	8	—				
,, D ..	1	1	1	Totals ..	50	45	5

* Midwives A refers to a number of nurses practising in the district from nurses' homes in the borough. R = recovery. D = death.

There are two types of the disease, mild and severe, of which the first is much the more usual. In the mild form crops of blisters appear at intervals, the whole illness lasting from one to several weeks but unassociated with any general symptoms, the infant thriving and developing normally. The severe form resembles a widespread exfoliative dermatitis accompanied by marked symptoms of toxæmia—wasting, prostration, and high temperature—and usually ends fatally. In the cases we have observed the characteristic sign has been the appearance of watery blisters in the groins, round the umbilicus, and on the fingers and head (Table II.).

TABLE II.—*Fifty Cases showing Area of Body on which the Rash First Appeared.*

	Cases.		Cases.
Groin	17	Buttocks	2
Umbilical region	10	Arms	2
Legs	10	Fingers	2
Face	3	Back	1
Head and neck	3		

The first blisters commonly appear from six to ten days after birth, although this by no means holds good in every case. In our series the shortest interval was one day and the longest 21 days after birth (see Table III.).

TABLE III.—*Fifty Cases showing Day of Onset of Disease after Birth.*

Day.	Cases.	Day.	Cases.	Day.	Cases.	Day.	Cases.
1st ..	1	5th ..	6	9th ..	2	13th ..	1
2nd ..	—	6th ..	10	10th ..	6	14th ..	1
3rd ..	2	7th ..	3	11th ..	1	Up to	
4th ..	3	8th ..	8	12th ..	2	21st ..	4

The size of the blister varies greatly, ranging from a little larger than a pin's head to that of a five-shilling piece. The smaller blisters not infrequently coalesce within a few hours to form larger ones. The contents of the blebs are clear at first, rapidly becoming turbid; the untreated blister breaks and discharges its contents, leaving a superficial, reddened, scalded-looking area. New epidermis soon grows over this, and no permanent scar is left.

Bacteriology.

The literature of the bacteriology of pemphigus neonatorum shows that various investigations have been made in this country and elsewhere and that several different organisms have from time to time been isolated from the blisters, but the weight of evidence points strongly to the *Staphylococcus aureus* as the organism most often present. Lereboullet and David,[2] who investigated a series of cases which were complicated by chicken-pox, were amongst those who isolated this coccus. We have not been in a position to make a bacteriological examination of the fluid in every case. In all the cases examined (with one exception, when a streptococcus was isolated) a pure culture of *Staphylococcus aureus* was grown from the fluid within the blebs. (We are indebted to Dr R. F. L. Hewlett, Pathological Department, Queen Mary's Hospital, Stratford, for having collected and examined the specimens in each case.)

Barber[3] says that "pemphigus neonatorum is contagious impetigo of the large blister or bullous type occurring in early infancy," and suggests "that a virulent coccus might, in the virgin soil of a new-born baby's skin, cause lesions of a different type from those seen in older children." Whatever the causal organism, there seems no doubt that the infection can be conveyed direct from one case to another by the doctor, nurse, or other attendant on the mother and infant. The fluid in the blisters appears to be the source of infection.

Infection and Spread of the Disease.

Pemphigus neonatorum is highly contagious; in a maternity hospital, unless immediately isolated, it spreads through the nursery with remarkable rapidity. Similarly, one case in the private practice of a district midwife may lead to a number of cases among her patients in a very short time. In the outbreaks occurring in our experience, no obvious septic foci which might account for the first case were found in those in immediate attendance upon the mothers and infants. Skin lesions were absent, and the nose and throat were examined with negative results. In only three instances was there a history of other illness in the home; in two cases older children were found to be suffering from impetigo and conjunctivitis, while in the third case one occupant of the house developed scarlet fever and erysipelas immediately before the confinement of the mother. Three of the infants were premature but only one was noted as weakly, this baby having also a harelip and cleft palate. A not insignificant fact was that one infant developed ophthalmia neonatorum, while three others had "sticky eyes"; in these cases the eye condition cleared up rapidly.

The origin of the first case in an outbreak is difficult to trace. In the individual case the organism may be introduced into the infant's circulation at the moment when the umbilical vessels are divided; this implies that pemphigus neonatorum is a blood infection producing a characteristic rash. But, if this were so, one would expect in all cases definite general toxic symptoms. In the majority of our cases the only manifestation of the disease was the rash. Falls[4] considers that the severe toxic type of the disease, ending fatally, is due to lesions on the abdomen spreading to the umbilical cord and producing a staphylococcal septicæmia. It seems more likely that the primary blisters are due to inoculation of the causal organism through some slight skin abrasion. The fact that the first blisters are most frequently seen on the "napkin area"—groins, upper thighs, and buttocks—or round the umbilical scar, lends weight to this theory. The fluid in the blisters seems to be the infecting agent. We have observed that if, when a blister bursts, the fluid is allowed to come into contact with the surrounding skin, a crop of fresh blisters frequently forms. In treatment the disease can be definitely limited by pricking each blister as it forms and carefully collecting the fluid, so that it may not come into contact with the adjacent skin surface.

The following two instances from the cases under our observation will serve to illustrate the way in which infection can be spread:—

Fifteen cases of pemphigus occurred in one midwife's (B) practice between April 14th, 1927, and Dec. 20th, 1927, resulting in one death. Within a period of three weeks from April 14th, 1927, four infants delivered by midwife B developed pemphigus; after each she underwent thorough disinfection. In spite of every precaution, including medical examination for any source of sepsis, she still continued to have pemphigus cases in her district. Owing to this she temporarily gave up work and was away on holiday for five weeks; during this period no case occurred in her district. When she resumed her practice six infants were infected within two weeks. Thereafter she was again medically examined for possible septic foci, but with negative result. The remaining cases in her practice in 1927

curred at longer intervals, when it was impossible to trace fection directly from case to case.

During the month of September, 1928, four cases of mphigus neonatorum occurred in the practice of two idwives who serve a comparatively small, isolated area of e borough where there had been no previous case of mphigus. There were four cases of pemphigus and one se notified as puerperal pyrexia within a period of 24 days. ll the evidence pointed to direct infection from case to case aving occurred in spite of apparently complete disinfection nd immediate handing over of the infected cases to the neral district nurses. We were quite unable to trace the igin of the first case. A possible explanation is that the home help " * engaged by the first patient came from a poor strict where several cases of pemphigus were known to ave occurred ; infection may have been brought by her, by friends from the same locality who visited this woman uring the lying-in period. No one in direct contact with e mother and infant had any sores or obvious septic foci.

Prevention of Spread.

(1) In an institution there must be rigid isolation mother and infant. The nurse responsible for ursing a pemphigus case must not undertake any her work in the hospital.

(2) In a district midwife's practice the midwife's uty is to seek medical advice at once. If she continues nurse the infected case she must not undertake ny further deliveries or nursing until the baby has een completely cured, and she herself has been horoughly disinfected. This procedure means a nancial loss for the average midwife. An alternative lan, though far from ideal, is for the midwife to pass ver the nursing of the mother and infant to the eneral district nurses, and then to undergo disin- ction of self, clothes, and midwifery bag, with ntents, before resuming ordinary duty. Obviously doctor or nurse suffering from septic skin lesions hould undertake a confinement or attend the mother nd infant during the lying-in period.

Treatment.

The method found by us most effective in bringing out rapid cure, and in preventing spread to other arts of the body, has been to give the infant a daily ath in a weak antiseptic solution, such as potassium ermanganate. The infant should be stripped and horoughly examined twice daily for fresh blisters. blister must be pricked as soon as it is discovered, sing every aseptic precaution, and carefully packing und the blister with sterile absorbent wool. Zinc nd boric dusting powder is then applied and the ffected areas are lightly bandaged. Greasy and moist pplications have proved less satisfactory. There is no need for further treatment in mild cases. The evere exfoliative and toxic type requires, in addition, ymptomatic and general stimulating treatment to aintain a satisfactory state. Gregorson [5] has eported good results from exposure of the infant to tra-violet light twice weekly.

End-results.

Five deaths occurred out of the total number. The ajority recovered completely within three weeks om the onset of the rash. Six cases were clear ithin one week ; in two other cases the rash per-

ABLE IV.—*Five Deaths from Pemphigus Neonatorum.*

Delivered by—		Day on which rash first appeared.			Length of illness in days.		
Dr.	Midwife.	4th	5th	6th	5	6	8
1	4	1	1	3	3	1	1

sted to the fifth and sixth weeks respectively. These otracted cases had no general toxic symptoms ; the fants thrived well, but fresh crops of blisters peared at intervals, thus keeping up the state of fection (Table IV.).

* An unqualified woman who is paid by the local authority to lp for several hours daily in the duties of the household during e lying-in period of the mother.

Of the five infants two died at home while three died in hospital after a stay varying from one to three days. In all these cases the illness was short. The certified cause of death in four cases was " pemphigus neonatorum " ; in the fifth case death was certified as due to " convulsions and pemphigus neonatorum."

Conclusions.

After carefully considering all the factors connected with the cases described, we feel justified in coming to the following conclusions :—

(1) Pemphigus neonatorum is a contagious disease rarely seen later than four weeks after birth. (2) The infection is probably conveyed from one infant to another by the agency of the doctor, midwife, or other attendant. (3) There are two distinct types of the disease : (*a*) a mild type, causing little general disturbance ; (*b*) a severe type, which tends to end fatally. (4) The first appearance of the rash is most often on the groins. (5) The disease seems to attack healthy infants, but shows a predilection for those born and living under unhealthy conditions of space, light, and air. (6) The specific organism has not been isolated, but the presence of the staphylococcus in the blister fluid has been demonstrated in a majority of the cases. A mixed infection may supervene and cause death. (7) The best form of treatment is to keep the affected area dry and aseptic ; no moist preparations should be used. (8) Any midwife or doctor who has been in contact with a case should not attend another confinement until thorough disinfection of both person and belongings has been carried out. (9) The disease should be made notifiable and, when necessary, mother and infant should be isolated.

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Clinical and Laboratory Notes.

CEREBRAL HÆMORRHAGE IN A HEALTHY CHILD

DUE TO TRAUMA, WITH RECOVERY.

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THIS case appears to us to be worth reporting because there are so few in the literature. The chief features of interest were : (1) cerebral hæmorrhage in a healthy child of 9 ; (2) hemiplegia of the internal capsular type, as commonly seen in the declining years of life ; (3) cerebral hæmorrhage due to a trivial knock ; and (4) the absence of any disease known to cause hemiplegia in children, or likely to cause disease of the blood-vessels.

A Case Described.

The patient, a healthy girl of 9, was dressing in her bedroom on July 29th, 1927 ; she stooped to pick out a pair of shoes from under a chest of drawers, one of the upper drawers of which was partly pulled out. On raising herself she hit her forehead just above the right eye against the edge of the open drawer. She walked a few steps to the bed, sat on it, and put on her shoes and tied them, meanwhile crying out to her mother, who came in. Then she fell on the floor, but was able to relate what had happened and to complain of pain in the region of the blow. A few spasmodic jerks in the left leg were observed, the child vomited once and then gradually lost consciousness. About ten minutes elapsed between the accident and complete coma.

When the patient was seen a few minutes later she was deeply comatose, the head and eyes were markedly deviated to the right, and the left side of the face was flattened and drawn over to the right ; paralysis of the left arm and leg

was diagnosed from the complete absence of tone in those limbs and knee-jerks and plantar reflexes were not obtained on the left side. There was no mark of injury on the forehead or elsewhere. After six hours she recovered consciousness and was seen to have a complete left-sided hemiplegia. She was able to swallow and to talk and there was no mental confusion. Conjugate deviation of the head and eyes persisted in some degree for about a fortnight. There was some precipitancy of motions and urine, but no marked incontinence. The temperature was normal; the urine was normal; there were no sensory symptoms. No other signs or symptoms developed and the patient steadily improved, getting out of bed three weeks later.

When examined four months later she showed the typical appearance of a partially recovered hemiplegic. The face had completely recovered. There was spasticity of left arm and leg with practically no loss of power or sensation, typical gait, and absent abdominal reflex with exaggeration of deep reflexes and extensor Babinski on the left side. Mentally the child was bright and happy, the urine and the blood pressure were normal.

When seen on Nov. 4th, 1928, 16 months after the accident, the patient had improved further. Spasticity of the arm and leg was less marked and the gait was nearly normal, but the left arm was still held flexed at the elbow and adducted. The child looked healthy and had grown considerably. She appeared mentally normal, but the school teacher reported that, compared to her previous condition, she was not at all receptive to new ideas and was inclined to be emotional over trifles. The reflexes showed no change and the urine was normal. The blood pressure was 134/80.

Diagnosis.

There seems to be no doubt that the lesion was a hæmorrhage into the right internal capsule. Embolism of one of the perforating arteries or of the middle cerebral artery is precluded by the fact that the symptoms did not develop immediately and also by the absence of any cause of embolism. A cortical lesion or a rupture of a meningeal artery is precluded by the extent of the paralysis, the conjugate deviation of the head and eyes, the flaccidity of the limbs, and the absence of irritative phenomena, as well as by the subsequent history. Both acute encephalitis and encephalitis lethargica start in rare instances with the development of hemiplegia. If the patient recovers, a condition of partial paralysis is left resembling the present condition of this child. The possibility of encephalitis was considered in this case, but was precluded by the absence of constitutional disturbance, by the speedy recovery from coma with no resulting mental symptoms, by the absence of signs of involvement of the mid-brain nuclei, and of myoclonic and athetoid symptoms. The interest lies in the hæmorrhage being caused by a trauma so slight that it left no mark a few minutes later, and the inability to discover any cause why a healthy child of 9 should have such a fragile "artery of cerebral hæmorrhage."

The previous history of the child sheds no light on the problem. Pneumonia with measles is the only illness from which she has suffered. The family history is excellent, the family is long-lived, three grandparents are alive, the parents are healthy, and the child has four healthy brothers.

Other Recorded Cases.

Cerebral hæmorrhage in children is rare; Osler [1] states that "apart from meningeal hæmorrhage, which is common as a result of the accidents of birth, hæmorrhage is rare in children, and we had no instance at the Johns Hopkins Hospital during my term of service." Sheldon [2] examined the post-mortem records of the Hospital for Sick Children. In 10,150 consecutive autopsies there were only 50 cases of intracranial hæmorrhage in children under 12. Excluding four cases due to birth injury, only three were due to trauma; the rest were caused by a variety of congenital and infective conditions. Sheldon's three cases are interesting. In the first the child had fallen against a cupboard some weeks previously; on the day of his death he vomited and became unconscious and paralysed in the left arm and leg. At autopsy a large clot was found in the right internal capsule. The second child hit his head against a table two days before death and at autopsy a hæmorrhage into the medulla was found. The third case was a boy who fell off a kitchen chair, becam unconscious shortly afterwards, and later showe convulsive movements of the right arm and l followed by paralysis. At autopsy the midd meningeal artery was found to be ruptured.

It is important to note from these cases that sligh trauma may cause not only meningeal hæmorrhag but hæmorrhage in the deep structures of the brai The long time which elapsed between the trauma an death in the first case is also interesting, and Mille has discussed this point in reporting the case of healthy child of 12 who died of an extensive subdur hæmorrhage seven weeks after a slight blow on th head. Even more difficult to explain are cases suc as those reported by C. O. Hawthorne,[4] in whic cerebral hæmorrhage occurred in healthy lads 17 and 14 years respectively without any history trauma, and without the discovery of any coincider disease post mortem.

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A CASE OF MALIGNANT ENDOCARDITIS OF THE TRICUSPID VALVE ASSOCIATED WITH DAILY RIGORS.

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THE following case is recorded because of i rarity, and also because of the difficulty in establishi a diagnosis:—

A married woman, aged 25, came to the out-patie department on Oct. 26th, 1928, complaining of loss strength and weight, and gave the following history.

Seven months before she had suffered an attack "influenza" which was characterised by generalised joi pains, palpitations, and excessive perspiration. The atta confined the patient to bed for 14 days. After a further co valescence of 14 days she returned to work (store supe visor) and carried on until two months before admissio when she gave up because of increased fatigue; during th time her only complaint had been that every morning s had a shivering attack which lasted one hour, causing her perspire excessively, and leaving her weak. After givi up work the "shivering attacks" recurred daily up to t time of admission. The patient thought she had beco anæmic, and had lost about 2 st. in weight. There was history of a rash, œdema of the legs, pain in the chest, tender spots on the hands. In her previous history a family history there was nothing of importance. She h not had rheumatic fever.

Condition on Examination.—The patient was a thin, pa toxic-looking woman. Her tonsils were large, but n obviously septic; no tonsillar glands. The first left mo tooth was "suspicious." Nothing abnormal was detected the neck and lungs. The respiration-rate was 24. The ape beat of the heart was in the fifth left intercostal space; t area of cardiac dullness extended to the left to the ape beat, and extended to the right 1 inch outside right borc of sternum. On auscultation there was a musical systo murmur, heard best at the apex and over the lower end the sternum. Pulse, 120 regular; blood pressure, 110/6 spleen, palpable on inspiration, soft regular edge; le nil abnormal; urine, a trace of albumin.

The patient was sent into hospital with the provisior diagnosis of malignant endocarditis. Whilst in hospi she had a daily rigor, occasionally two in the 24 hours.

These rigors continued until the first molar tooth w removed, four weeks after admission. After this, t temperature rose daily to 103°–104° F. (but no rigc occurred) until the day of her death, eight and a half wee after admission. During these weeks the patient felt w and wished to get up, even on the day of her death, and t only alteration in the physical signs was a progressi anæmia (see blood counts). The cardiac condition remain unchanged, and no embolic phenomena occurred. Thr blood cultures, taken at the time of the rigors, were negati even after 15 days' incubation.

The absence of a positive blood culture, of embolism, d of changes in the cardiac condition lead to doubt to the accuracy of the diagnosis of malignant docarditis. The following differential diagnoses re considered: malaria, miliary tuberculosis, æmia, perinephric abscess, sinusitis, typhoid, lkæmia, *Bacillus abortus* infection. Appropriate thological and radiological investigation gave no idence of any of the above conditions. The blood unts were as follows:—

—	Oct. 26th.	Nov. 13th.	Dec. 11th.
d cells	4,128,000	2,324,000	1,677,000
hite cells	16,400	8,800	4,000
emoglobin	39·0%	24·0%	23·0%
lour-index	0·47	0·51	0·68
lymorphs	82·8%	78·8%	85·2%
mphocytes	15·2%	12·8%	14·0%
raline..	2·0%	2·8%	—
utrophil myelocytes	—	5·2%	0·4%
ast cells	—	—	0·4%

n Oct. 26th there were a few blood corpuscles in e urine, and also on Nov. 13th; their presence in r opinion is not sufficient evidence to establish e diagnosis of renal infarction. (The post-mortem ndings bear this out.)

Post-mortem Findings.—Only those bearing on the agnosis are given. Right and left pleura: excess of dark aw-coloured fluid. Right lung: no infarcts. Left ng: no infarcts. Pericardium: excess of dark straw-loured fluid. Heart: weight 13 oz. Left ventricle, nil normal, except toxic, pale muscle. Right ventricle greatly ated and filled with clots. Valves (mitral, aortic, and lmonary), nil abnormal. Tricuspid, two large vegeta-ns hanging from the left edge of the left anterior cusp; llow in colour; about ½ in. long by ⅜ in. wide; not ry friable or ulcerated. A few minor vegetations. No ngenital abnormalities. Spleen: large, toxic, fairly firm, infarcts. Kidneys: extremely pale, capsules stripped sily, no infarcts.

Discussion.

The diagnosis was in doubt during the whole of e illness; there were present only two of the four iteria which Sir Thomas Horder [1] gave in his mleian lecture of 1926 as necessary for the tablishment of the diagnosis of malignant endo-rditis—namely, pyrexia, endocarditis, embolism, d positive blood culture.

The rarity of the condition is one point of interest. 1920 Dietrich [2] reported a case in which the only idence of endocarditis was a systolic murmur heard l over the pericardium. Blumer,[3] in a review of 0 autopsies of malignant endocarditis, found only ree cases in which the tricuspid was involved alone. r Thomas Horder considered this condition of fficient rarity to give complete details of a case in s Lumleian lecture, 1926. Here, again, the only nical evidence of the endocarditis was an apical stolic murmur. Thayer,[4] in his series, found the rtic cusps involved in 66 per cent., the mitral in per cent., and the *right* heart valves as often as the itral (pulmonary and tricuspid).

The other point of interest which our case produces the occurrence of daily rigors. Although occasional gors are not uncommon in the disease, it is seldom at they are so frequent and regular as in this case. och,[5] in 1897, reported a pseudomalarial type of ptic endocarditis which was of 13 weeks' duration d had daily rigors. Leyden [6] reported a case in nich rigors occurred twice daily. In this case, as the other cases reported, the tricuspid endocarditis ve no characteristic murmur.

Our best thanks are due to Dr. C. R. Lane for his thological investigations.

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Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE.

A MEETING of this Section was held on Jan. 25th, with Dr. F. E. FREMANTLE, the President, in the chair. A discussion on

VACCINATION AGAINST SMALL-POX IN THE LIGHT OF RECENT EXPERIENCE

was opened by Prof. J. C. G. LEDINGHAM, who said that the vaccination problem in its various aspects required review in the light of recently acquired knowledge. For many decades the study of vaccine virus had been limited to improvements in the technique of preparing lymph. One result of this detachment had been that lymph manufacture had come to be regarded as a sort of mystery cult. Outbreaks of cow-pox were frequent and ought to be scientifically investigated. It was not always possible to refer them to an origin in human small-pox or vaccinia, but available evidence undoubtedly pointed to contact with human vaccines. In a recent German outbreak the children of the milker had recently been vaccinated. Variolisation of bovines had sometimes been accomplished with remarkable ease; for example, in tropical countries where small-pox outbreaks had necessitated immediate supplies of lymph. There was experimental evidence that horse-pox was like cow-pox and due to the same modified variola virus. Most strains used in lymph institutes had been derived initially from human small-pox. Small-pox virus direct from man regularly produced a dermal response in the normal rabbit, but never when rubbed into the scarified skin. Repeated passage was necessary. Small-pox virus had, after accommodation to the rabbit, behaved like vaccinia when transferred back to man, so that the calf was not essential for the realisation of this modification of small-pox virus, a change which manifested itself by innocuousness for man and loss of contagious power. Initial passage through the monkey undoubtedly facilitated accommodation to rabbit and calf, but chiefly by providing a large supply of fresh potent virus. The complete change to vaccinia did not seem to take place in the monkey, as monkeys had given small-pox to unvaccinated attendants. Some element responsible for producing generalised lesions, as distinct from general invasion, was lost in passage to the rabbit or calf. This element might be another virus or the change might be one of general virulence-loss combined with increased affinity for skin tissue. There was good evidence that vaccinia afforded better protection against small-pox than small-pox did against vaccinia. The "attenuated virus" remained the most efficient immunising agent, but it was possible that variola vaccine of known recent origin might prove better still. There was no more pressing problem than that of the standardisation of the immunising powers of the viruses, and especially of vaccine strains. There was no satisfactory evidence that sheep-pox and fowl-pox had any intimate relationship with variola and vaccinia. Sheep and fowls were quite susceptible to experimental vaccinia. The vaccine virus produced a general disease, though it did not produce macroscopic lesions elsewhere than in the skin. Serious action at a distance was at least a possibility. In the rabbit grave illness or death after cutaneous vaccination with calf or other lymph of dermal origin was extremely rare, but some forms of virus, particularly those from cerebral or testicular sources, were liable to cause generalised skin lesions, especially after inoculation into the vascular system. There was experimental evidence that the addition of tissue extracts—e.g., testicular or renal—to vaccine virus had a very definite enhancing effect on the

virus response following intradermal inoculation. The inflammatory reaction was markedly greater, developed more rapidly, was more diffuse, and showed a tendency to early necrosis. Rabbits might occasionally become ill and emaciated or die, and necrotic lesions in the lungs might be found post mortem. In the speaker's opinion this illness depended solely on the stimulation by vaccinia of a latent pasteurellosis infection in the rabbits concerned. This mutual interaction between viruses, particularly the stimulation of a latent bacterial infection by a virus, was of great significance.

Types of Small-pox.

The speaker preferred the name "alastrim" to Garrow's "para-smallpox" because he had failed to find any outstanding differences between the form in this country and that in Brazil, West Indies, America, and South Africa. There was experimental evidence that the disease was a small-pox variant. It was readily communicable to the monkey by scarification. In the rabbit it produced typical vaccinia-like vesicles only after repeated passage, but material direct from man when inoculated intradermally produced characteristic reactions which were neutralisable by antivaccinia serum. On the rabbit's cornea the virus usually produced a positive Paul's test, and Guarnieri bodies were found. Paschen's elementary bodies were present in smears from early vesicles and a precipitin reaction had been obtained with alastrim material and antivaccinia serum. Experimentally vaccinia gave more certain protection against alastrim than alastrim gave against vaccinia. Some persons were so constituted that they did not respond to infection by an adequate immunising reaction; black races, for instance, were unusually susceptible to small-pox, against which they developed only a feeble immunity on recovery. Alastrim was probably a stable variant of small-pox. In England there had recently been a few localised outbreaks of the virulent form of small-pox, and it only led to confusion if deaths arising from this were added without reservation to the general mortality-rate of small-pox. Rajchman seemed right in concluding that two entirely distinct types of small-pox prevailed and bred true. The virulent form had a mortality-rate which fluctuated, in long waves of six to seven years, between 10 and 30 per cent. The mild type had minimal figures from 0·1 to 0·3 per cent. There was no evidence that minimal periods in the case-mortality of the virulent type were simply transitions towards an alastrim period with its negligible mortality.

Post-vaccinal Encephalitis.

These cases had shown a decided tendency to occur in groups, especially in country districts, and sometimes corresponded with the autumn prevalence of poliomyelitis or the spring prevalence of encephalitis lethargica. The apparent constancy of the period after vaccination at which nervous symptoms appeared might fit in with a theory which presupposed that some latent neurotropic virus in the vaccines was activated by vaccinia. There was no good evidence of vaccine virus producing lesions in the central nervous system unless it were inoculated directly into the brain. The histology was characterised by one very important lesion: perivascular demyelination, which was common to the encephalitis after measles, the myelitis of rabies treatment and certain forms of acute encephalomyelitis. Neither in acute poliomyelitis nor in encephalitis lethargica did perivascular demyelination appear, but the histology of these infections might or might not be modified by a concurrent vaccinia. Fortunately post-vaccinal encephalitis was rare. Practically all the cases had been primary vaccines and most of them had been children of school age. This might be due to the fact that in the allergic or accelerated reactions shown by partially immune subjects the virus was precluded from invading the central nervous system. There was no means of detecting beforehand the patients who possessed this peculiar liability, but their existenc was an argument for stressing infant vaccination an taking great care with the primary vaccination c older children and adults.

Is Universal Vaccination Desirable?

A certain small proportion of alastrim cases ha troublesome symptoms and profuse—occasionall hæmorrhagic—rashes. Alastrim might cause deat in feeble people or sufferers from other disorders It was a completely preventable yet not a death dealing disease when it attacked the unprotected Variola, however, had a tradition; it had alway ranked with plague and cholera as a death-dealin disease against which a civilised community mus protect itself. Hence the expensive paraphernalia c small-pox control was maintained, although th disease as it now manifested itself was almost harm less. Vaccination was cheaper than isolation an hospitalisation, and would abolish the disease alto gether. Vaccination and revaccination could "delive the goods." That being so, the problem of alastrir ought to be considered afresh and not as a tradition policy. No serious attempt had ever been made t explain to the man in the street what vaccination wa and what it was calculated to do. Cheap broadcas information and the help of an intelligent press wer needed. Experience of post-vaccinal encephaliti offered a strong argument in favour of primar vaccination in infancy and of reducing the dose t one insertion. This would also diminish the risk c sepsis. Under present conditions it might be debate whether compulsory vaccination were justified, an whether the prophylactic would not meet with fulle acceptance if it were purely optional and introduce to the people with the accompaniment of a sympa thetic and informative propaganda.

Dr. KILLICK MILLARD said that few people no regarded alastrim and small-pox as the same thing they were two entities—variants or mutants, bu fixed. There was no evidence that one changed int the other. The present administrative position wa eminently unsatisfactory and was becoming farcical to lump the two variants together in the same colum negatived the statistical value of the records. A far as the individual went vaccination and revaccina tion could "deliver the goods," but it was impossibl to point to any community in which they had effect tively prevented small-pox. In practice it was impos sible to vaccinate everybody regularly, and attempt to do so had always failed. During the last 24 year there had not been a single death from small-pox i Leicester, where the methods followed had bee isolation and hospitalisation. In face of that, was i possible to ask the whole population to underg vaccination which, after all, was a disease wit certain results, usually temporary, but sometime permanent, and occasionally followed by grave effect on the nervous system? It was necessary to recog nise the fact that major small-pox had left the country Unless it returned and could be controlled by n other means the people of this country would neve accept universal vaccination.

Sir GEORGE BUCHANAN said that the effect o advocacy of vaccination must depend on what state ment could be made about its safety. It was ver important that all possible risks, however rare, shoul be fully investigated. The problem was a universa one, not concerned with the British mentality alone It was important to see how far the disasters whic had occurred were the result of some coincidence o passing phase of some virus infection, and how fa they were due to some constant phenomenon asso ciated with vaccination. The League of Nations wa doing valuable work in collating evidence fron different countries.

Dr. S. MONCKTON COPEMAN recalled his own worl on vaccinia during the last decade of the las century, and expressed his gratification that hi findings had been confirmed by recent work. He ha never once failed to carry either small-pox or vaccini to the monkey, though the former could not b

nverted straightway to the latter in that animal. was possible that inoculated small-pox, rather an ordinary small-pox, might be the source of cow-x. He had obtained a number of excellent strains vaccine lymph from cow-pox. When the first tbreak of alastrim had occurred in this country in 03, Sir Clifford Allbutt had said, "Well, then, if is is small-pox, there is an end to all diagnosis"! ere was a difference between small-pox and alas-im, for a certain number of cases would take vaccina-n during convalescence from alastrim. Cultures small-pox material in the fertilised hen's egg in 95 had produced an excellent strain of variola ccine, but this was said to have led in South African tives to severe generalised vaccinia and some aths. Vaccination had suffered from the "poor-y taint," and it would be better when it came der the public health authority.

Dr. R. P. GARROW said that when speaking of "two seases" he had meant no more than a "fixed riant." For all practical purposes the two were fferent. Mild small-pox had never been absent m his district for eight years and was not likely be, for people had discovered that an attack was better investment than vaccination. They got ree weeks in hospital, where they were very com-table, and their insurance money when they came t. The disease was not worth preventing. Much mage had been done to the cause of vaccination assuring people that small-pox was a loathsome d fatal disease; it was neither—nowadays. Among 00 cases he had never seen anything resembling morrhagic or toxic phenomena. It was extra-dinarily difficult to get at the truth. He had sited districts where medical officers of health had imed that the disease was increasing in virulence d had found no change whatever. He had been red of any views he had ever held about the advisa-ity of compulsory vaccination. He challenged as sleading Dr. Millard's statement that vaccination l not protect the community; there were completely ccinated communities and these were completely otected. To admit that the community would not ail itself of vaccination was not the same thing as claring that vaccination protected the individual d not the community.

Sir WILLIAM HAMER argued the view that post-ccinal encephalitis was a fortuitous event, due to incidence in time of vaccination and an influenzal other form of encephalitis.

Dr. R. W. JAMESON pointed out that officially riola major and minor did not exist; there was ly one disease. This hampered scientific work. o one could say that the victims of "post-vaccinal cephalitis" would not have died if they had not en vaccinated, and the theory that vaccination rely activated another virus would not comfort e relatives. The statement that it did not occur infants was unreliable, as the ordinary practitioner l not know what a baby died of and certified the se as "marasmus" or "convulsions" when it ght be encephalitis. In fact we knew nothing at about vaccination except that it did not usually l babies at once and that it conferred some tem-rary immunity; we did not know what it did to e children afterwards. To talk about universal ccination in non-epidemic periods was as useful as try to persuade people to stay at home for fear street accidents. Vaccination should not be vocated until something was known about it.

Dr. MAJOR GREENWOOD applied to the discussion e remark of Sherlock Holmes: "You have con-cted a very consistent investigation, Watson; I not at the moment remember any conceivable nder that you have omitted to make." He garded Dr. Millard's remark—to which Dr. Garrow l objected—as perfectly logical. A dreadful ount of nonsense was perpetually talked about ccination, and that was the difficulty. In Jenner's ssical paper no mistake was omitted that could ssibly have been made, and there was a good deal evidence that Jenner had been a rogue. Unfortunately the antivaccinationists could never get away from Jenner's roguery, and the trouble was that Jenner had been perfectly right in his guess. The difficulty of the orthodox school was that they could never decide which horse to ride. They would talk about vaccination having modified the epidemiological history of small-pox, whereas small-pox had changed many times before vaccination had ever been thought of. Why should they not treat vaccination like any other form of prophylaxis and advocate it only when circumstances of special risk were incurred? The whole problem of herd immunity and individual immunity was in its infancy and nobody knew the truth about it.

Dr. J. A. H. BRINCKER agreed that alastrim was a stable variant, and related the history of vaccination among London school-children during the last few years. Among some 6000 vaccinated only one case of encephalitis had occurred. He supported Prof. Ledingham's conclusions.

Dr. S. F. BEDSON urged the importance of seeking some safer method of vaccination. In foot-and-mouth disease, distemper, yellow fever, and fowl plague it had been found possible to immunise by an initial dose of formalised killed virus consolidated later by a dose of live virus. It might be possible to deal with small-pox along these lines. He could not agree that post-vaccinal encephalitis had no connexion with vaccination; it would not occur if the virus did not generalise, a danger which would be decreased by a divided method.

Dr. W. K. SIBLEY said he had never seen a case of generalised vaccinia. Vaccinia was a localised disease of the cow's udder and he did not see why it should ever generalise. He asked why four inoculations should be necessary for vaccination when one was sufficient for other infections like syphilis.

Prof. ARTHUR ELLIS supported Dr. Bedson's plea, as he had seen four healthy children die of post-vaccinal encephalitis within three weeks. He considered that we were being neglectful and negligent in this matter.

Prof. LEDINGHAM, in reply, said that this was not the time to hold exaggerated views about the seriousness of things like post-vaccinal encephalitis. The problem could only be solved by further experiment. We had not got an efficient vaccine virus and research on a large scale was not being carried out; in fact, the need for it had only recently become apparent.

MEDICO-LEGAL SOCIETY.

A JOINT meeting of this Society with the Maternity and Child Welfare Group of the Society of Medical Officers of Health was held on Jan. 24th, Sir WILLIAM WILLCOX, President of the Medico-Legal Society, being in the chair. A discussion on

CRIMINAL ABORTION AND MEASURES NECESSARY TO REDUCE THE SALE OF ABORTIFACIENT DRUGS

was opened by Dr. F. J. MCCANN, who said that the practice of abortion was undoubtedly increasing and that on an average 25 per cent. of abortions were criminal, although the figures varied with the locality. Some women aborted easily; others could be subjected to the greatest possible internal and external violence and yet fail to abort. For the benefit of legal members who did not understand the anatomy of abortion, Dr. McCann then showed a number of diagrams and described the relations of the female pelvis. A distinction between the "medical man" and the "unskilled abortionist," he said, was not justifiable, for many unqualified abortionists became highly skilled and many doctors were quite unskilled. All kinds of instruments had been used, and there was no doubt that a woman could successfully pass an instrument on herself. Usually her effort was fatal, but some successes had been attained by the injection of soapy fluid into the uterus through a catheter. The one thing that haunted the abortionist, skilled

or unskilled, was shock, which could neither be foretold nor prevented. Some women were far more liable to shock than others. Factors in its production were the state of mind in which the abortionist's patients came to him and the fact that they were usually wilful and disobedient, insisting on keeping at work. Rest in bed was more necessary after artificial than after natural abortion.

Drugs used for abortifacient purposes were of two types: emmenagogues and ecbolics. In Austria abortion by drugs was said to be diminishing and giving place to mechanical means; phosphorus had been used in Vienna and was said to cause retroplacental hæmorrhage. Arsenic and mercury might cause severe vomiting and diarrhœa without producing abortion. Most terrible of all was diachylon; for one penny a woman could get enough diachylon plaster to poison her, cause abortion of her child, and leave her a mental and physical wreck. Something must be done to regulate its sale. THE LANCET had done a very good work in inquiring into the contents of the pills and potions advertised as abortifacients. One sample analysed had contained colocynth, aloes, ergot, borax, sulphate of iron, and hellebore. The advertisements were less common than they had been, but the trade went on. No alteration in the law was necessary. The Home Secretary and the police had only to be encouraged and the whole thing could be stopped. Dr. McCann suggested that as the outcome of the meeting the Home Secretary should be asked to receive a deputation to discuss what could be done to stop the advertisement and sale of abortifacient drugs; that lead should be included in the Dangerous Drugs Act; and that a council should be formed to inquire into and report on all these proprietary preparations before they were exposed for sale.

The Paramount Importance of Public Opinion.

Dr. R. A. LYSTER said that the law might be considered satisfactory if it were energetically administered. The law dealt with the situation in a drastic fashion, originally from the moral aspect—the desirability of preventing evil-doers from escaping the consequences of sin—but more especially later from the point of view of the general sanctity of human life. There was a tendency to alteration in that attitude to-day; it was very unusual nowadays for a charge of murder to be instituted as a result of destruction of the embryo. The point of view taken by most medical officers of health now was that of the serious effect of abortion on the infant mortality and maternal invalidity rates. A successful abortion often meant a damaged woman and an unsuccessful one meant a damaged woman and a damaged child. In his opinion fatalities were tending to decrease, but it was doubtful whether damage was decreasing as well. The questions that called for serious consideration were: What was to be the future of abortion? Was the public modifying its view about the criminality of the act? What would be the effect of the incidence of an enormous number of voting women? Would drastic measures be likely to have a successful issue? And could the law be tightened up? Diachylon had recently been included in Part I. of the poisons schedule, but it was doubtful whether this had had any appreciable effect on the general tide of abortion, although lead was the surest and most certain abortifacient known. A great deal of nonsense was talked and written about abortion. The only certain abortifacient was a general poison; lead would only cause abortion when it had produced general poisoning. It was no use legislating unless the people were behind the law. Dr. Lyster was doubtful what the real opinion of the people was. Abortion was a very grave national danger and likely to affect the physique of mothers and children, but to plunge too precipitately into any campaign might cause more harm than good, as there might well be a revulsion which would produce more difficulties than at present existed.

Sir BERNARD SPILSBURY said that everyone engaged in medico-legal work must be appalled at the amoun of abortion that was going on, and the estimate o 25 per cent. as criminal was certainly not an exag geration. The change in fashion was striking; i recent years the drugs used were not often thos which endangered life, but there was no means o judging to what extent they were successful. Man were comparatively harmless and very useful fo other purposes; they must frequently be taken wit success by those women who aborted readily. Th history of an instrumental interference almost alway revealed that the woman had first had resort t drugs, though seldom dangerous drugs, the use o which was largely restricted to doctors and chemist who had easy access to them. Quinine had been ver largely used just after the war, and in one case hydras tine had been procured by a chemist's assistant Pituitary extract did not lend itself to administratio by a layman, as it was only effective hypodermically On the whole the dangers and use of ecbolic drug and of general poisons were very limited at th present time, and the number of cases of poisonin by drugs used for ecbolic purposes had very greatl diminished. The speaker had not seen a fatal cas of lead poisoning since 1918, and poisoning fro mercury, phosphorus, arsenic, and cantharides ha been comparatively rare at all times. It was a ver different story when he turned to the heterogeneou action drugs advertised for female irregularitie Drastic purgatives were very largely sold for abortio and it was extremely doubtful whether their sa could be restricted without interfering with the legitimate use. As abortifacients these drugs eith failed, or succeeded in producing an abortion tha was exactly like a natural one and was not followe by the dangers of instrumental interference. The was, therefore, very little information about then A host of other drugs were advocated, many of the having apparently little value. Nevertheless n drug—not even pennyroyal which had a reputatio as an abortifacient—could be classed as perfectl harmless, for its reputation must be founded on som success, and the woman who miscarried easily migh abort after it. Many patent medicines were used i this way, for instance, Beecham's pills, but their sa could not be restricted when they were in such gener use. In the present poisons schedule we had such restriction as limited the use of drugs that were reall dangerous, and the rest should be left to the educa tion of the general public. Abortion was not popu larly regarded as a crime, and often no one was mor surprised to hear she was doing wrong than a woma who gave another one advice on how to get rid of baby. Despite his fearful results, the profession abortionist was a popular person. Instrument means were being used more and more. The speake held an autopsy on a case of this kind about onc every ten days. Abortion was a danger, wheth skilled or unskilled. Haste and secrecy were essenti to any illegal act and this ensured unsatisfactor conditions of cleanliness and care. There was grav risk of sepsis—the commonest of all dangers. Th gross injuries of earlier days were seldom encountere now; lacerations were rare, but sepsis, hæmorrhag and shock persisted and death resulted from then The most fashionable method during the last 15 o 16 years had been the injection of fluid into th uterus; it had perhaps been introduced from th Continent by Belgian refugees. Apart from shoc this was fairly safe and seemed to be successful in good proportion of cases. With the increase of know ledge there had been a change in the methods, an skilled operators now favoured electrical mean Only by educating the public into the wrongfulne and especially the dangers of abortion could we hop to bring about any improvement.

A Gynæcologist's Experience.

Mr. H. BECKWITH WHITEHOUSE said that most o the preparations sold were frauds on the credulity o the public. He was amazed at the extraordinar moral mentality of the woman who had made up h mind to terminate a pregnancy; no persuasion o

[1] THE LANCET, Dec. 10th, 1898, and many succeeding issues.

eat would turn her from her purpose. Out of five nen who had asked him to procure abortion for m during the last six months, four had been ried. Two of these had persuaded other doctors do it on medical grounds; one had had pelvic mbosis and had been in bed since August. A d had done it for herself by injecting hot water her bath and had had a stormy convalescence. fourth had taken several colocynth and aloes s followed by ergot, had partially aborted, and had a severe hæmorrhage. The only single woman he five was continuing her pregnancy. Abortion he popular mind seemed to be a matter of small nent, and most doctors must have been acces- es after the fact at some time or another. The of lead had now disappeared from Birmingham, pennyroyal, aloes, and ergot were now the ionable drugs of the obstetric underworld, but ause of their uselessness they were largely being laced by instruments. The appliance most often nd was the "slippery elm," a long tent of elm d inserted in the cervical canal. It was on record t a woman had successfully passed a knitting dle on herself 35 times. The speaker had removed elm tent from the bladder and a bone crochet dle from just below the liver. This latter patient's had been saved by her sister—a trained nurse—o had insisted on a vaginal douche and sterilisation the instrument before the woman passed it. It s not the drug so much as the dose; in a hyper- sitive woman a large or even a reasonable dose of armless drug in common use might induce abortion. ther argument against restriction of the sale of gs was that it would lead to more extensive use of ruments. Restrictions of sale would not stop minal abortion and—apart from lead—would do re harm than good. Often a woman who had d various drugs in vain would think twice before ing further steps. The longer the products of ception remained in the uterus the less likely was maternal instinct to be perverted; the first two three months were the dangerous period. The ention of women should be called to the risk to lth and happiness entailed by abortion, a risk ich did not end with the abortion. Recent work on corpus luteum had suggested that if pregnancy e violently ended a lutein cyst was likely to result. ortion might have some more lasting effect than was pected. Women had a very real regard for their aries, and might hesitate to procure abortion if they ught they ran a risk of losing the ovary thereby.

The Legal Position.

Mr. H. D. ROOME, after referring to the case of "Reverend Francis Bacon," said that the law ded no strengthening; if properly applied it was f, clear, and thorough. It was contained in two rt sections of the Offences Against the Persons t, 1861. The first made it a criminal offence for any son to use an instrument or any other means atsoever or to administer any poison or other xious thing whatsoever with intent to procure carriage of any woman, whether she be or be not h child, under a penalty of penal servitude for life. e second section, made law for the first time in 1861, hibited the supply or procuring by any person with like intent either of instruments or poisons or any er noxious thing whatsoever, on a penalty of five rs' penal servitude. A noxious thing had been ined as any preparation administered in quantities ely to produce abortion. The quantity was portant, but if a reputed poison were used with ent to procure abortion the quantity would be elevant. Ecbolics within the poison schedule were ot, savin, arsenic, cantharides, belladonna, tartar etic, and lead. There was no infallible ecbolic, but h things as quinine, aloes, oil of juniper, gamboge, nyroyal, and hellebore, if administered at the tical time, were likely in many cases to be successful. mething might be done by scheduling some of these gs, though it would be impossible to restrict them . It had never been murder to destroy an embryo, t it was now rare to indict an abortionist for murder, even if the woman died. The legal test was whether, as a reasonable man, he would be likely to anticipate that death or grievous bodily harm would be likely to result from his operations. This put a premium on the skilled operator, who was less likely to expect mishaps than the unskilled. The real cure for abortion was a change in public opinion. When it was no longer regarded as shameful for an unmarried woman to perform the most natural act in the world, when there was more charity, when public opinion came into line with recent legislation which provided maternity benefit for married and unmarried alike, when there was more tolerance, so that the unmarried mother could bring up her child without reproach, then alone would a real and permanent cure for abortion be found.

Dr. ROCHE LYNCH thought that drugs were just as much in vogue as ever they had been; they were always tried first. Often the drugs supplied had absolutely no abortifacient properties; in one case a girl had spent £40 for potions consisting of iron salts, caffeine, starch, and traces of garlic, clove, and sage. The doses were very small and the sale was a rank swindle; steps might well be taken to stop that sort of thing. Much the commonest of the more potent drugs used was aloes, usually in combination with iron. Drug vendors were scared of preparations that came under the Poisons Act. It would be practically impossible to put lead under the Dangerous Drugs Act, and lead abortions would not thereby be stopped. In one case abortion had been procured by drinking vinegar in which lead piping had been steeped for a week or two. The only possible limitation would be to stop the sale of this class of drug by any except qualified chemists.

Miss SUSAN MUSSON (Secretary of the National Council for the Unmarried Mother and Her Child) said that her Council was very anxious that something should be done. The death-rate among illegitimate children was nearly twice that among legitimate. The girls with whom they dealt had usually not the slightest idea that they were doing anything illegal in procuring abortion; even workers did not realise the dangers. She quoted instances of girls spending enormous sums on different preparations; gunpowder in gin and "hiccory piccory" were quite often used. Many social workers could provide evidence if it could be taken up. Newspaper advertisements continued to appear; Old Moore's Almanack in particular was full of them. If something could be done to stop them it would go a long way.

Sir WILLIAM WILLCOX agreed that public opinion was the important factor and mentioned that "hiccory piccory" was the old preparation of aloes and colocynth, known as "hiera-picra."

Lord RIDDELL said that the Advertising Association had taken up the question of abortifacient advertisements in a drastic manner and had persuaded a number of papers to refuse them. He would be glad to receive the names of any offending papers with a view to sending an admonition from the Association. If an advertised drug was claimed to "remove all female obstructions however caused," it was either a fraud or an abortifacient. Criminal prosecutions by private persons were serious and expensive, and, if unsuccessful, were apt to put the prosecutor in an awkward position. In his experience the police were not backward in taking steps when members of the public supplied them with evidence. There was no doubt that the disgrace attending the birth of an illegitimate child was responsible for a great many abortions and maternal and infant deaths, and a vast amount of invalidity. It was useless to shut our eyes to the fact that many women did not regard abortion as a moral offence; what really mattered was the psychological situation, the heart of the individual. If the bulk of the women in the country believed that abortion was not wrong, then it would go on.

Dr. NORMAN HAIRE emphasised the fact that there was a strong trend of opinion among people of high moral views that abortion was not a moral offence. In Russia and Czecho-Slovakia it had been legalised

up to the third month, the woman going before a commission in a town or the medical officer of health in the country to obtain permission. It would be impossible for any law to prevent abortion by drugs. A census among doctors and lawyers asking how many of them had attempted to procure abortion in their own families would—if answered truthfully—produce surprising results. In the last issue of the *British Journal of Actinotherapy* a new contraceptive appliance had been described, depending on the ionisation of quinine in the vagina. It was to be used "soon after connexion." He would like a legal ruling whether, if it were used next morning, or the day before the expected menstrual period, it would become an abortifacient. If a patient, to whom a doctor had given this contraceptive in all good faith, used it a few days after the period had failed to arrive, would the doctor become an accessory before the fact of attempted abortion?

Prof. LOUISE MCILROY said that she came across an enormous number of cases. She thought that abortion would go on as long as it was helped by the medical profession who gave assistance afterwards without betraying the patient or being able to take any steps to prevent further attempts. She would like to know if the profession would always have to wait until the patient died before informing the police.

The PRESIDENT said that the police had great difficulty in getting people to come forward with evidence against abortionists, and the authorities felt very strongly that it was most undesirable to institute proceedings without strong grounds. The opinion of the public and of women about the moral aspect of abortion had been mentioned; the opinion of the doctors had also changed profoundly. A departmental committee on poisons was sitting, and it was not unlikely that the law on this subject would soon undergo considerable modification.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society on Jan. 28th, with Dr. WALTER CARR, the President, in the chair, a discussion on

STARVATION IN TREATMENT

was opened by Dr. E. I. SPRIGGS. Starvation, he said, was the fate of many organisms, but man had been able to fight this risk by preparing and transporting food; so that it was possible to relieve individuals and nations who through destitution or famine were unable to procure it. Fifteen years ago starvation as a natural phenomenon among mankind seemed to be dying away, but during the late war millions of people underwent semi-starvation.

Among civilised peoples to-day there was more danger from over-feeding than from under-feeding; hence the withdrawal for a time of some or all the normal food was recognised as being good for many diseases. Starvation had been defined as the want of that material which the organism needed, either in whole or part. It had been well said that a man could do without oxygen for a few minutes, without water for a few days, without food for a few weeks. It was the last which was now being considered, and when food was withdrawn for therapeutic purposes, water was given freely. Starvation might be complete, except for water, or might be partial; that is, a mixed diet might be given containing all essential foodstuffs, being simply, in total, of low caloric value. In complete starvation the predominant symptom was hunger, which was not synonymous with appetite, for a person could have an appetite without suffering hunger, and things liked could be eaten even when hunger had been satisfied. Indeed, most people had never really experienced hunger. Hunger consisted of definite pain at the lower part of the sternum, a pain which was insistent but intermittent. It did not come on until some time after the stomach had been emptied. Weber, 70 years ago, ascribed this pain to contractions of the stomach. Dr. Spriggs thought that the most valuab report on the symptoms of starvation was that Benedict, who fasted 31 days. When food w withheld, the body was not at once starved; it simp lived on its store instead of on food ingested. Wh food was not taken, almost the only part of the bo which was thereby saved work was the alimenta canal. Body-weight was lost rapidly at first, th settled down to a weight loss of about 1 lb. per die Those who had plentiful fat naturally had a larg store to draw upon. Starvation limited both t internal and external movements of the body, a on the seventh day of the fast the man had got h expenditure down to 1700 calories in place of t 2500 normal. When fasting, the body showed great power of internal economy, and the end can when mobilisation failed, death occurring when a adequate amount of nourishment was not suppli to some important organ of the body, despite t fact that there might still be some of the store le One man who fasted 31 days had at the end this time a systolic pressure of 110, compared wi one of 132 when he commenced his fast. In anoth case a blood pressure of 120 dropped to 110 or 10 In the case of a man in Germany, hunger-strikin during the war, the systolic pressure fell to 55. T temperature did not fall, or only very little, duri a fast, but prolonged and curious mental stat might arise in the process. Commonly, fasti people felt that they had more mental and physic energy than usual, but this sensation was not bor out by actual tests. The power to fast and st remain efficient varied a good deal with individua Tanner had fasted 40 days, but a man seeking emulate him had to give up on the fourteenth da Apart from fat, the first loss of weight during a fa fell on the glands—liver, spleen, and pancreas. Ne the muscles suffered. Heart and brain showed good deal of conservation. At the end of a long fa the heart was found to have lost 20 per cent. of i weight, and the brain 15 per cent.

When food was stopped the first call was on t glycogen in the liver, whose store was soon almo used up, but hardly ever had it been found that t last part of the glycogen had gone from the bod When this had been depleted, the body called up its much more mobile stores of nitrogen, using the deposited protein in four or five days. T excretion of nitrogen was then 11 or 12 g. a da If other than protein food was being given—star or fat—the excretion of nitrogen could be kept lo During fasting the main source of energy was t fat; only when the available fat had been used was the use of protein increased. Owing to the lar oxidation of fat, the person was apt to have acidosi this could be detected early in the fasting by estimati the alveolar CO_2; it was also shown by a considerab excretion of acetone as a later phenonemon; it w regarded as the cause of the headaches complained by fasting people. The fasting treatment of epilep had now been supplanted by giving a diet containi no carbohydrate, thus giving food but causing much acidosis as possible. Some held that fasti "cleared the blood"; but the nitrogen content the blood was found to alter very little, any alterati being in the direction of concentration. There w more than the normal uric acid in the blood of fasting person, and amino acids were present small quantity; they were not increased, though t globulin content rose to some extent. The amou of calcium and fat in the blood was increased duri a fast. People with achylia experienced the sam sensation of hunger as did other people.

Fasting had no known specific effect on the healt body except to call into being its whole resistance the risk of a "protein death." The idea that t bowel could be purified by fasting was negatived actual observation on the intestinal flora. T "experiment" of the late war confirmed the scienti work of the previous generation as to what were t needs of the people. During a great part of the w the German people averaged about 1300 calori

ly, and in a general way considerable body-weight s lost. There was, likewise, a lessened efficiency d a greater tendency to disease. It was noticed ring this period that few diabetics and cases of esity were seen by medical men. For a long time er the war nervous sequelæ persisted, pernicious æmia was common, myœdema cases became worse, did influenza patients, and diarrhœa was very quent. In the same way, convalescence from ease was slower, due to the lack of proper food. st digestive diseases increased markedly during s period, not only because of the food intake being minished, but also due to a large part being vege- ble food. For a considerable proportion of the ple a vegetable diet was not suitable.

Starvation in Disease.

Dr. Spriggs said that starvation was used for local ease of the alimentary canal; for acute conditions h as acute appendicitis and peritonitis it was valuable temporary measure. For general states should not be prolonged; short complete fasts re good in many complaints—i.e., giving no food, t allowing plenty of fluid, for two or three days. was stated in Germany that all endocrine activities re diminished by fasting, as also was the activity the sexual glands. Experimental animals fed ely had a more rapid growth of any tumours than en food was restricted, and it was probably alleled in the case of man. In nephritis work s spared the kidney by cutting off some of the d intake; also, because the calcium in the blood s increased by fasting, the latter was good for kets and for the vomiting of pregnancy. When pregnant woman fasted for a short time it did t adversely affect the child.

Fat could be got rid of either by increasing the enditure of energy or by diminishing the intake food. But it was found that as increased exercise ant increased appetite, no measure was effective ich did not definitely cut down the food. He d not found that such measures as massage, baths, ., really brought down the weight. He gave to patients mixed diets of carefully measured quan- ies. The most successful cases were those which eived the commencement of the treatment in an titution, and were then given tables and quantities work by. He had now, for working purposes, a ge variety of tables, designed to suit all kinds of cases. believed in allowing four meals a day. Towards tenth day of restriction it was usual for patients feel depressed and miserable; it was then well to e a generous chop, or something of the kind.

The speaker advised medical men to have nothing say to the woman who, though not obese, wished weigh a stone or so less. A man weighing, at years of age, 25 st. 11 lb. (height 5 ft. 8 in.) com- ined of breathlessness and headaches, as well as eeded movements. As he had a quick pulse he s not allowed to indulge in exercise for some time. eatment in his case was carried out for eight and a f months, at the end of which time his weight nt down to 11 st. 11 lb. That was nine years a. Reporting himself a year ago, he said he had n at business ever since; he then weighed 16 st. ese people showed a marked tendency to develop betes. An ordinary reduction of diet, without ting off carbohydrates, suited many cases of mild betes very well. Insulin, happily, had now come efully to the rescue.

Fasting was a cult, and the method was liable to se, inside as well as outside the profession. Special ures," like the "potato cure," or the "orange e," nearly all had the weakness that they did supply the fundamental amount of nitrogen the needs of the body. He concluded by relating ase of death from one of these cures at Göttingen, harge of manslaughter arising from it, and a fine 300 gold marks.

Discussion.

Dr. PARKES WEBER characterised fasting as a untary return to the involuntary habits which dominated the lives of our primitive ancestors for thousands of years. At that period none survived who were unable to accommodate themselves to the hard conditions of primitive life, a life of which intermittent fasting formed a part. He divided present-day humanity—for this purpose—into (*a*) those who seldom ate more than was good for them; (*b*) those for whom the maintenance of full bodily health meant intermittent periods of food limitation. In some people such restriction of diet was followed by a lessened liability to cold and sore-throat. It might also be good for hyperthyroidism.

Dr. A. FEILING showed and demonstrated the temperature chart of a case in which starvation resulted in a dramatic termination of fever. The patient was a young man, aged 21, who for a week before admission to hospital had been showing a temperature of 103° F. in the evenings. It seemed to be typhoid or paratyphoid. The abdomen was distended and somewhat tender, but he never had a rash, and the spleen was not palpable. He was starved, except in regard to water, for three days. Then followed a diet consisting entirely of sour milk. The temperature never rose again and the patient was discharged cured.

Dr. E. GRAHAM LITTLE, M.P., said he could probably be described as somewhat of a crank in the use of starvation in the treatment of skin diseases. These diseases admitted of no pretence, they were on the surface, and if the patient was not cured the fact was obvious. He had had some amazing results from carrying out a certain degree of starvation. His interest in this means was aroused ten years ago during a visit to New York, when one of the best known dermatologists there, himself a sufferer from a skin disease, controlled it by a diet of rice, bread and butter, and water. He was able to live comfortably on the diet for a week or so without losing weight appreciably. But a more effective method, which Dr. Graham Little recently became cognisant of, was that going under the name of Welper, of Paris. He took over to Dr. Welper a medical friend who was obviously dying of diabetes. On instructions the patient began to starve, and did so regularly on two days a week. That was seven years ago; the sugar had been kept in abeyance, and the subject of the condition was still carrying on a lucrative practice.

The method which the speaker had prescribed now for eight years was a combination of fasting and purging, the latter being, in his view, as important as the fasting for the purpose in view—namely, the detoxication of the system. He enjoined fasting for 36 hours, no food being taken except orange-juice and water; also a large dose of aperient—Dr. Welper favoured Glauber salts. The modern conception of skin diseases consisted largely of the idea that they were cutaneous reactions to the absorption of various toxic products, some autogenous, some from outside.

One remarkable case was that of a patient with acute lichen planus, the irritation from which, as was well known, sometimes drove the sufferer almost mad. He prescribed for this patient two days' fasting, giving a purge on the first day. He did not see the patient again, nor hear from the doctor, but he encountered the latter recently and learned that within a week of the short course the eruption had vanished.

Dr. H. A. DES VŒUX said he had used starvation in two types of cases. One was that of the overfed child of rich parents, who was given frequent feedings, and who was recognised by the distended abdomen. They usually looked wizened and unhappy. The effect on them of the starvation treatment was very striking. The other type in which he used it was the patient who had an acute illness, like pneumonia. For 20 years he had used for these cases the water treatment. It was a great mistake in these cases to have the nurse giving food of some kind to the patient at frequent intervals. Such patients were too ill to digest food, and they should not be troubled with it. They never died of starvation, because

they had a good reserve of food on which they were able to draw.

Dr. A. CAWADIAS said people undergoing starvation felt very well during the first few days of it. But there then followed a period of apathy, with no zest for food, and a progressive loss of weight set in, with a lowering of the blood pressure and a slowing of the pulse. The patient was then in a condition of indefinite equilibrium, and any infection would be followed by a catastrophe. After about ten days there ensued the state in which starving people had died—convulsions, coma, and other collapse symptoms. There were two distinct phases in starvation. In the first the digestive organs were at rest, and any imperfectly metabolised products which happened to be present were metabolised completely, and there was also mild protein shock caused by some disintegration of protein. In the second there was a complete change, the thyroid being in a condition of atony, while the nervous system was disturbed. The urea nitrogen in the blood, also, was increased, and later occurred a disturbance of the mineral equilibrium, with a fall in the sulphur content. The lesson of this was that in carrying out this treatment the toxic phase must be avoided.

Dr. GEORGE GRAHAM said the occurrence of hunger pains in people who were undergoing starvation treatment could be taken as an indication that the carbohydrate in the diet had been brought too low. There was too little sugar in the blood. If, in the case related by Dr. Spriggs, in which the diet was reduced to 700 calories value, the carbohydrate had been increased to 80, there would have been no need to give either extra meat or bovril.

Reply.

Dr. SPRIGGS dealt briefly with the points raised. In pneumonia he gave fruit juice in preference to water, and added to it glucose. Single-food "cures" were very useful for odd days; six oranges in a day was to the patient a very grateful change from the prescribed dietary when the latter had begun to pall. He agreed with Dr. Cawadias as to the importance of avoiding the stage when there occurred a disintegration of protein. An increase of sulphur he took to be evidence of tissue breakdown. He agreed with Dr. Graham's remark.

EDINBURGH OBSTETRICAL SOCIETY.

AT a meeting of this Society on Jan. 9th, with Dr. HAIG FERGUSON, the President, in the chair, Dr. H. S. Davidson, Dr. Douglas Miller, and Dr. Elsie Crowe communicated a paper on

ECLAMPSIA.

Dr. DOUGLAS MILLER began by referring to the discussion on the prognosis and treatment of eclampsia at the Congress of Obstetrics and Gynæcology at Liverpool in 1922. At this congress, he said, the advantages of conservative over more radical methods of treatment were so convincingly emphasised by the relatively low mortality in the Dublin group of cases that the Dublin method of treatment, with minor modifications, had been employed as a routine in the Edinburgh Royal Maternity Hospital during the five-year period 1923–27 inclusive. Dr. Miller presented a survey of 159 cases of eclampsia treated by this method and comprising an analysis of such symptoms and signs as coma, the number of fits, the degree of œdema, the degree of albuminuria, blood pressure, pulse-rate, and temperature in their relationship to prognosis. He said that the findings largely confirmed what was already believed in regard to the prognostic significance of these phenomena. An important exception, however, was noted in regard to blood-pressure readings, for in the series of cases studied, the mortality-ratio had proved to be in inverse proportion to the height of the blood pressure. When the systolic blood pressure at the time of admission to hospital was under 150 mm. H a case mortality of 27 per cent. was recorde whereas, in a second group, with blood pressu ranging from 150–180 mm., the case mortality w 14 per cent., while in cases in which a blood pressu over 180 mm. was noted, the case mortality was per cent. No satisfactory explanation could offered for figures so much at variance with what w generally believed about the serious prognos significance of high blood pressure in eclampsia. was found that while the absence of œdema w associated with a mortality of 24 per cent., t presence of marked œdema carried with it a deat rate of over 30 per cent., a moderate degree of œde being much less serious than either extreme. Furth investigation showed that in each of the four fa cases in which œdema was absent, death result directly from intense toxæmia, whereas in 5 out of t 12 fatal cases in which œdema was extreme, p monary complications contributed largely to t fatal issue, death being due directly to pulmona œdema in four of them. It would appear, therefo that while the absence of œdema was a sign of gre danger, possibly because it implied concentration toxins in vital tissues, extreme œdema carried with a special risk of pulmonary involvement.

The fœtal and neonatal deaths numbered giving a mortality percentage of 39·1. The exc sion of 28 cases in which the child was deliver before the thirty-sixth week of pregnancy, and 14 cases in which the child was believed to be de at the time of the patient's admission to hospit gave a reduced fœtal and neonatal death-rate 18·5 per cent. There were 28 maternal deaths in t whole series, a mortality-rate of 17·6 per cent. T figure compared with a mortality of 25 per ce during the ten-year period 1912–21. The causes death, confirmed in 22 cases by autopsy, were follows: toxæmia 13 cases, pulmonary complicatio 7 cases, cerebral hæmorrhage 6 cases, septicæmia case, and acute heart failure 1 case. In conclusio Dr. Miller said that while in general the intensity toxæmia could be reliably gauged by the exte and severity of the signs and symptoms specia considered, it was necessary to bear in mind t notoriously uncertain course which any case eclampsia might follow, so that even when the ome were favourable, response to treatment might f suddenly and apparently without reason, so th hopefulness was replaced by grave anxiety. particular, it had been found in this series that t occurrence of cerebral hæmorrhage seemed to be little relationship to the severity of the disea In only one of the six cases in which death was d to this complication had the toxæmia been so sev as of itself to make the prognosis anxious, nor any of them had the systolic blood pressure exceed 180 mm. In a hæmorrhagic toxæmia of this natu the occurrence of hæmorrhage in the brain, or, the other hand, in some less vital tissue, such as t liver, appeared to be largely a matter of chance a an accident over which the attendant had little no control.

Dr. ELSIE CROWE then gave a short résumé of t chemical findings in 86 cases of eclampsia. As result of these investigations she was led to t following conclusions: (1) That almost all cases eclampsia sustained renal damage, as shown by a diminished power of excretion and of concentrati of urea (MacLean's urea-concentration test), and a high blood-urea. The concentrating power the kidney varied at different stages of the illne and might greatly improve as the patient's gene condition responded to treatment. The normal bloo urea in the second half of pregnancy was abo 16 mg. per 100 c.cm., while that of the average eclamp patient was twice as high (32 mg. per cent.). T higher the blood-urea the worse was the progno in most cases. (2) That the tests of renal functi were of doubtful value. The large majority of ca showed definitely impaired excretory power wh tested by Rosenthal's method (intravenous injecti

a known quantity of phenol tetrachlorphthalein, d the estimation of the amount of dye removed m the blood stream by the liver in a given amount time), and almost half the cases of eclampsia d a positive van den Bergh and a positive Fouchet action. These results had apparently little bearing the clinical aspects of eclampsia and were of little gnostic value.

Dr. H. S. DAVIDSON referred to the high mortality cases with low blood pressure, and thought that is might be due to a profound affection of the yocardium by the toxæmia, thus lowering the blood essure. He referred to the small number of deaths m heart failure associated with shock and collapse, ich bore out the importance of non-interference the ordinary case of eclampsia. He made special erence to the number of deaths from pulmonary lema and wondered whether œdema was directly ceable to the use of ether as an anæsthetic or ether it was just part of the general œdema. It came a question whether, when an anæsthetic was quired, chloroform should be given as suggested Stroganoff or whether some other form of narcosis, ch as gas and oxygen, should be adopted. It was ry difficult to carry out the Stroganoff treatment hospital, and he could find no good purpose served venesection which could not be as efficiently rved by veratrone. Dr. Davidson referred to the eatment of eclampsia by intravenous injection of agnesium sulphate which he had been trying for the st six months with good results, although up to date ly eight cases had been treated. Magnesium lphate acted as a sedative and anticonvulsive agent d produced a marked elimination by causing a rge increase in the urinary output. This was llowed by a marked diminution of œdema which was obably general and affected the brain as well as her tissues. He concluded by considering the eatment of the fulminating type of eclampsia and oke of the bad results obtained by any conservative ethod of treatment on such cases. He thought at by Cæsarean section the prognosis might be nproved in these cases.

Reviews and Notices of Books.

EUROLOGY.

Degeneration and Regeneration of the Nervous System. By S. RAMON Y CAJAL, M.D., F.R.S., Director of the Instituto Cajal, Madrid. Translated and edited by RAOUL M. MAY, Ph.D. Harv., D. ès Sc. Paris. In two volumes. London: Humphrey Milford, Oxford University Press. 1928. Pp. 769. 50*s*.

THE scientific work of Prof. Ramon y Cajal is nown wherever neuropathology is studied or stology taught; at one time or another every edical student has become familiar with his name; it hitherto the results of his labours have appeared ly in Spanish. An English edition, in two volumes, that corpus doctrinæ which was awarded a Nobel ize is sure of widespread appreciation. Yet at the st glance its appeal may seem somewhat limited. rgely by the application of a histological technique hich bears his name, Prof. Cajal has devoted his udies to the problems of the degeneration and generation of the neurone, and begins by showing at the long controversy as to the continuity or scontinuity of that structure is finally settled favour of the former. How much in reality has pended on this solution those can appreciate best ho understand that theories of trophicity and coverability of tissue are based on the behaviour the individual neurone under pathological conditions. he next step is to take the reader through a long ries of investigations dealing with the reaction of the urone to lesions of sensory and sympathetic ganglia, spinal cord and roots, cerebellum, and cerebral cortex respectively. In each instance the phenomena of degeneration are examined with an infinity of care, as regards both peripheral and central elements, and the differences between the attempts at effective regeneration at various levels are fully illustrated. Indeed, it is remarkable that at lower levels (peripheral nerves and even spinal cord) a very fair effort at self-regeneration is accomplished by neuronic activity, under propitious circumstances, whereas in the brain attempts to innervate the cicatrices of trauma appear always to be lacking. Nor in this latter instance is there anything to hope from the beneficial effects of time. The deficiencies preventing restoration have been discovered by Prof. Cajal, who has shown that the outstanding problem is the supply of adequate nutritive material to stimulate and invigorate the indolent and scanty growth of neuronic sprouts.

The more one probes, under the leadership of such an authority as Prof. Cajal, into the minutiæ of neuronic existence the more clear does it become that the general trend of this remarkable research is towards the mysteries of cell-life. The sensitivity of the neurone to harmful agencies is the other side of its marvellous capacity for the delicacies of neural function; more than any other tissue in the body it is responsible for heredity, adaptation, and growth. Histological study of the kind here pursued can never be too painstaking, since in the activities of the cell we touch the unknown and elusive arcana of life itself.

The A B C of Nerves. By D. F. FRASER-HARRIS, M.D., D.Sc., F.R.S.E. London: Kegan Paul, Trench, Trübner, and Co., Ltd. 1928. Pp. 223. 4*s*. 6*d*.

IF there is such a reality as an A B C of nerves its exposition in Dr. Fraser-Harris's hands can be trusted to represent accepted physiological fact dressed in a pleasantly readable and literary garb. We may assume, perhaps, that in the view of some moderns the idea that a little learning is a dangerous thing is démodé, and that the more difficult, complex, and intricate a subject is the more will certain minds deceive themselves into supposing that a superficial acquaintance with it makes up for their inherent incapacity for grasping its profundities. We are glad that Dr. Fraser-Harris recognises the impossibility of distinguishing between what is elementary and what advanced in respect of the nervous system, and we note that he admits the constitution and functions of that system are so little matters of common knowledge that practically nothing of its physiology is known to the ordinary reader. Frankly, neurology is a technical subject, just as much as the law. If anyone wishes to ascertain some of the elements he can scan this primer with advantage. Criticism of what must have been a distinctly arduous task—viz., to teach the neurological alphabet to non-medical reader—is not called for.

RODENT FLEAS AND PLAGUE.

Rongeurs et puces dans la conservation et la transmission de la peste. By RICARDO JORGE, Director of Public Health, Portugal; and E. ROUBAUD, Professor of Entomology, Pasteur Institute, Paris. Paris: Masson et Cie. 1928. Pp. 306. Fr.30.

THIS work is the outcome of a vast inquiry (1924–27) undertaken, with the help of various nations, by the Office International d'Hygiène Publique and Prof. Roubaud was asked to complete the work with a systematic description of rodent fleas, with drawings and photographs. Of these illustrations it may be said that they are as good as such things can be, and they will be useful for purposes of identification where actual specimens are not available. When the true cause of plague was discovered and the disease was placed on a scientific foundation attention

was mainly concentrated upon rats and mice. As time went on it was found that all rodents were liable to suffer from plague and might be, more or less, carriers of the plague bacillus. Even the section containing hares and rabbits is not exempt. A few years ago two hares and two rabbits were found suffering from plague, probably caught from rats, in Suffolk, and *Ochotana daurica*, the "rat-hare," is frequently found infected in East Russia and Trans-Baikalia. In Siberia, China, and elsewhere the marmots suffer from epizoötics and often start epidemics. Of these the most dangerous is the large marmot, *Arctomys bobac* (the tarabagan). Not so very long ago 70,000 persons died of pneumonic plague in Manchuria, which began among the trappers who hunt this marmot for its fur. In North America ground squirrels are a danger, and in South America the wild *Cavia aperca* has been found carrying *Pasteurella pestis*. In Africa epizoötics occur among gerbilles and other wild rodents that are attracted to villages and farms in search of grain and may thus become a danger to human beings. These are only a few examples out of the many recorded in this book. But it is still the rats, *M. rattus*, *M. decumanus*, and *M. alexandrinus* that give the most trouble. They breed rapidly and have become "domestic" in houses, barns, and sewers. They also travel to and fro in ships. Any infected ship's rats may not only cause an outbreak of plague on the ship itself but they may also infect other rats or mice in the ports which the ship visits. Following the general and very complete summary by the chief compiler there are good plates showing the tarabagan, the spermophile, the souslik, the ground squirrel, the gerbille, and the multimammate mouse. Among the fleas that convey plague from animal to animal, or from a rodent to man, no doubt the most important are the rat fleas of the genera Ceratophyllus and Xenopsylla. Of the latter genus *X. astia* does not appear so dangerous as the other species. Many fleas die of suffocation during an epizoötic owing to the rapid growth of the bacillus, and it is not every infected flea that transmits infection; but, generally speaking, it can be said that all species of fleas found on rodents are capable of transmitting plague. *Pulex irritans*, the human flea, and others can also transmit infection. Annexed to Prof. Jorge's general summary are some reports reproduced from the monthly *Bulletin* of the International Office. They come from Great Britain (1924), Italy, South America, South Africa, the Soviet Republics, China, Japan, &c., and are worth reading as containing much information concerning the local rodents and fleas as well as notes on epidemics and prophylactic measures. The last 56 pages contain systematic descriptions, by Prof. Roubaud, of 35 rodent fleas, and 50 more are mentioned but not fully described. Seven excellent plates show many of these fleas. An index of rodents and fleas is provided. We can recommend this book as both interesting and useful.

VARICOSE VEINS.

Varicose Veins and their Treatment by "Empty Vein" Injection. By RONALD THORNHILL, M.B., Ch.B. London: Baillière, Tindall and Cox. 1929. Pp. 63. 5*s*.

The Treatment of Varicose Veins by Intravenous Injections. By J. D. P. MCLATCHIE, M.D., C.M., Physician, Western Skin Hospital. London: William Heinemann (Medical Books), Ltd. 1928. Pp. 51. 3*s*. 6*d*.

THE growing interest in the injection treatment of varicose veins is reflected in the increasing number of books devoted to the subject. Sir Berkeley Moynihan, in his foreword to Dr. Thornhill's book, writes: "In surgery the search is always for simplicity. Complicated and cumbersome methods which are inherently dangerous give way by degrees to simpler and safer procedures. In surgery, as in the other arts, the easy way is often the outcome of long experience and of trial and error." These words should do much to allay the fears of those who are still prejudiced against the use of intravenous methods in the treatment of varicose veins. The author is a follower of the quinine school, though, of course, using other solutions in cases where this particular drug is contra-indicated. His technique consists essentially in the introduction of the solution into the lumen of the vein when this is devoid of blood, and a full account of this procedure is given. It is claimed that adequate thrombosis can be obtained by using not more than 1 c.cm. of the solution. As regards the complications of the method it is admitted that despite the most rigid precautions sphacelus will occur in a small percentage of cases. Some account of the general reactions which may be produced by quinine should have been discussed. In considering the treatment of cases who have had phlebitis the author very wisely urges caution. For cases of varicose ulceration Humbert's method of using Unna's paste is advocated, but no critical account of the limitations of associated injection treatment is included. The book is enhanced in usefulness by the fact that the writer has been content in the main to concentrate on only one method, and to mention other methods but briefly. Ten illustrative cases are considered in an appendix.

Dr. McLatchie, after a short historical account of the development of injection treatment, describes the technique he employs in using the various sclerosing solutions. He prefers in general the sodium salicylate method, but uses the quinine and urethane solution in certain selected cases. Of the last-named solution doses up to 6 c.cm. are advocated; it is found in practice, however, that local and general reactions to doses of this size may be rather severe. The question of the advisability of giving injections immediately after the subsidence of an attack of acute phlebitis is highly debatable, since the risk of lighting up the infection is no small one. The safer course is to wait for an interval of at least six months after the phlebitis has cleared up before considering the question of injection treatment. Disregard of this rule has in the past certainly led to accidents. It is to be hoped that in future editions much more stress will be laid on "white leg," since it is by far the most important contra-indication met with in practice to injection methods. Only too often patients with this condition are sent up for treatment. An inclusion of the author's experience in dealing with the various types of varicose ulceration would have been valuable, for it must be conceded that not all cases respond equally well. The book is well written and should prove a useful introduction to the practitioner wishing to take up injection treatment. A considerable bibliography is appended.

COMPARATIVE ANATOMY.

Vertebrate Zoology. By G. R. DE BEER. London: Sidgwick and Jackson. 1928. With 185 text-figures. Pp. 505. 15*s*.

ZOOLOGY was at one time taught by going through the systematic catalogue of animals—their phyla, families, genera and species. Huxley and Martin introduced the type system in which a few examples are studied in detail and compared with one another. Both methods have their advantages, and Mr. de Beer has combined them in a novel way which should be fruitful. He first describes the anatomy of nine vertebrate types and the development of amphioxus, frog, fowl, and rabbit. He then takes each system (blastopore, skin, tail, brain, ductless glands, &c.) and discusses their varied representations in vertebrates. Finally, he weaves the whole together in a most interesting discussion of evolutionary morphology in which structure, function, and history combine to make one of the noblest tales which man has put together.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 2, 1929.

THE MEDICAL EDUCATION OF WOMEN IN LONDON.

THE Committee on the medical education of omen undergraduates submitted last week a report [1] hich has received the general approval of the enate of the University of London. After a careful irvey of the evidence derived from the authorities the London medical schools and from various ganisations indirectly interested, the Committee ate as the first of their well-considered conclusions: We are unable to see any valid argument . . . gainst the provision of co-education in medicine." he very form of these words shows that their attitude as been critical and that they have approached the ubject from a practical standpoint. The points in difficult story may be recalled. Some 12 years ago rtain London medical schools opened their doors women students, some without consulting the enate, and all but one have closed them again without xplanation. The natural corollary of this withrawal from what seemed a progressive policy on the art of constituent schools of a university whose prepossession . . . is in favour of such coducation" is an inquiry into the reasons which oved the authorities of the schools to change their iews. Was it, for example, because difficulties arose connexion with the conduct of, or accommodation or, the new-comers? Or was it because the men udents applying for admission to every one of the ixed schools became so numerous after the war at some of them would have had to be refused if omen applicants had been accepted? Which, in ort, of the many reasons which might have led to is reversal of policy did in fact lead to it, and was the same reason in every school? The answer iven in the report seems clear:—

"The real difficulties arise from (*a*) the multiplicity of edical schools and their competition for students; and) the feeling against co-education entertained by some of e men already in the medical profession, some of the en students, and a section of the public. With few xceptions the authorities of the medical schools appear be convinced that men, if they have a choice, prefer to to schools which do not admit women, and that the eling is strongest among the men, and in some cases the arents of the men, who on general grounds would be most esirable. Since there are now certainly not enough udents to fill all the schools, this means if some schools dmit while others exclude women, that co-education is an unstable equilibrium, and that the school which dmits any women will have a disappearing number of en."

That this antipathy to co-education exists in some uarters must be admitted. The attitude of the oung men is comprehensible, when we think for a oment of the deep-seated tradition upon which is based—and that is what has to be borne in mind. Only those who forget it point, as though with a decisive finger, either to jealousy, academic or economic, or to rivalry on the playing-fields as being the real motives of the reluctance of young men to join the mixed school. These may fortify the attitude, but it is produced by more fundamental things and has to be reckoned with. Since the Dean is the business head of the school under his care, it is his duty to see that a good type of youth is not discouraged from selecting a particular school by any factor that disturbs the instinct towards sex separation that is developed among young men in the public schools, and perhaps fostered in them by a university career. The natural reaction from the war period, when women invaded so many spheres previously sacrosanct to men, was to emphasise for a time a desire to revert to pre-war ideals—a reaction that has been manifested in many spheres of thought and activity. This may be a passing phase, and there are signs even now that the prejudice against co-education in medicine, as against cöoperation between men and women in other directions, is lessening. The medical student ultimately will have to accept among his colleagues, whether in private or general practice, in the public health services, or in the laboratory, a proportion of women. Is the association to begin when he leaves his public school, or when he commences his professional work? The Committee hold that co-education forms a valuable training for the coöperation which in their subsequent careers becomes necessary between medical men and medical women, though their comment that the advantage is felt less by men students than by women students is, as yet, supported by facts.

Not only for the practical reasons set out in the report, but for more subtle ones, the provision of co-education cannot be coerced; if it is to be successful it must be not only a permissive reception, but a cordial welcome. In proportion as the women at any medical school are received as part of the corporate body and given adequate chances of post-graduate employment, their careers have been creditable to the individual school and to the university to which it is attached. The Committee has now cleared the ground. It must be left to the individual schools to see whether too much permanent importance has not been attached to a natural post-war phenonemon. To read the signs of the times is not easy, and to prophesy is even less easy. But there is evidence that those signs are changing in such a way as to enable the authorities of the medical schools in London to welcome back the women students without risking the defection of the young man with fine traditions, even though those holding the contrary view are more vocal in expressing their sentiments.

[1] The report is set out in full on p. 251.

THE ENCEPHALOMYELITIS OF MEASLES.

RECENT epidemics of post-vaccinal encephalitis have aroused a renewed interest in other uncommon forms of acute encephalitis, especially those complicating the exanthemata. These serious complications of the specific fevers have been familiar to clinicians for over a century, but it is only lately that careful histological examination of the nervous system has been made in fatal cases, and that the ætiology of these conditions has been seriously considered. Two recent contributions to our knowledge of the subject have been made by Dr. F. R. FORD,[1] who reports

[1] Ford, F. R.: Bull. Johns Hopkins Hosp., 1928, xliii., 140.

12 fresh cases of "the nervous complications of measles," and Dr. J. G. GREENFIELD,[2] who has made a pathological examination of a fatal case.

Dr. FORD, reviewing the literature, finds 113 cases of nervous symptoms complicating measles, in addition to the 12 he reports himself. The onset is usually on the fourth to the sixth day of the illness, after the fever has fallen and the rash has begun to fade. Dr. FORD distinguishes the following clinical types: (1) A mild and transient disturbance characterised by stupor, headache, meningeal signs, and sometimes convulsions, a clinical picture resembling "meningism" or "serous meningitis." These cases are characterised by the absence of focal signs and by prompt and complete recovery. (2) A group with multiple focal or diffuse lesions of the nervous system. These cases may show symptoms of lesions of the cerebral cortex, the basal ganglia, brain-stem, cerebellum, and spinal cord, and as might be expected, overlapping of symptoms renders exact classification impossible. Complete recovery occurred in 14 out of 42 cases of this group. Residual mental defect occurred in 15, some disturbance of motility in 11, epilepsy in 4, and narcolepsy in 1. Five patients died. (3) Single focal cerebral lesions. Of these, hemiplegia and aphasia are the commonest. Of 27 patients in this group 8 recovered completely and 1 died, the remainder being left with hemiplegia. (4) Cerebellar syndromes occurred in 14 patients, in 12 of whom recovery was incomplete. (5) Paraplegia and spinal cord syndromes. These may occur with or without concurrent involvement of the brain. The clinical picture in this group is an acute ascending paralysis. Of 33 patients 6 died and 15 recovered completely. (6) Other nervous complications are rare, the least uncommon being toxic psychoses. Papill-œdema may occur. The cerebro-spinal fluid usually shows a moderate increase in lymphocytes and protein, but may be normal. Dr. GREENFIELD'S pathological investigation confirmed the findings of other workers that the most characteristic change in the nervous system is a zone of demyelination (loss of myelin sheaths) around many of the small veins. These areas are infiltrated with leucocytes, which in early cases may resemble lymphocytes or polymorphonuclear cells. Later fat granule cells and swollen neuroglial cells are to be found. Cellular infiltration of the perivascular sheaths is an inconstant feature. There is great vascular congestion and multiple small hæmorrhages may be present. These pathological findings have received different interpretations. Dr. GREENFIELD regards them as evidence of inflammation, but Dr. FORD describes them as a "toxic degenerative rather than an inflammatory process." Dr. GREENFIELD stresses the clinical and pathological similarity of the disease to post-vaccinal encephalitis, and takes the view that encephalitis complicating measles is due not to the virus of measles, but to a special neurotropic virus which resembles, if it is not identical with, the virus responsible for post-vaccinal encephalitis. It will be noted that Prof. J. C. LEDINGHAM, introducing an important discussion last Friday at the Royal Society of Medicine (see p. 231), remarked on the tenability of a theory which presupposed the activation of some latent neurotropic virus in post-vaccinal cases.

We publish in this issue a clinical and pathological report on "six cases of acute meningo-encephalomyelitis of childhood," by Dr. RUSSELL BRAIN, Dr. DONALD HUNTER, and Prof. H. M. TURNBULL. The authors stress the clinical resemblance between their cases and cases of post-vaccinal encephalitis and encephalitis complicating the specific fevers, and it may be remarked that Dr. BRAIN and Dr. HUNTER'S six patients exhibited among them four out of the five clinical pictures described by Dr. FORD as occurring in the encephalomyelitis of measles. The pathological picture in the fatal case, however, was that of a profound toxæmia, and the nervous system showed neither perivascular demyelination nor leucocytic infiltration. This case, however, was an extremely acute one, "meningeal" in type, and it is possible that the less acute cases exhibiting clinically diffuse focal involvement of the brain would have shown different pathological features. These cases naturally raise the question whether they may have been due to the same hypothetical virus which has been held responsible for post-vaccinal and other similar forms of encephalitis. The pathological evidence is for the reason indicated inconclusive. Moreover, assuming that a virus may sometimes operate alone and sometimes as a secondary invader, we do not know whether the same pathological picture is to be expected in both circumstances. For the present we must be content to suspend judgment on this point. The problem is one, as Prof. LEDINGHAM said, which can only be solved by further experiment, and it is to be hoped that the publications cited will lead to a more widespread recognition of obscure forms of acute meningo-encephalomyelitis, so that thorough clinical, pathological, and bacteriological investigations may be carried out on a large number of cases.

[2] Greenfield, J. G.: Proc. Roy. Soc. Med., 1929, xxii., 297.

ABORTION, CRIMINAL AND OTHER.

THE criminal statistics of the offence of procuring abortion seem almost reassuring. The latest figures are those for Scotland in 1927; in that year eight cases came to the notice of the police and resulted in the conviction of three women. The last English figures are those for 1926; they show 41 such charges tried. The annual averages for the quinquennial periods from 1900 to 1925 in England begin with 11, 20, and 30—a steady climb. In the war period there is a jump to 43; in the period 1921–25 a slight decline to 37. That is one side of the picture. It suggests that criminal abortion in Scotland is almost negligible and in England by no means grave—in both countries a far rarer offence than murder. The other side is painted very differently by speakers at a recent meeting of the Medico-Legal Society (reported in another column), who declared that abortion is undoubtedly increasing and that 25 per cent. of the cases are criminal. The difficulties of prosecution are notorious. No evidence is forthcoming from the woman who has courted the dangers of abortion; if a professional abortionist has been at work, he has taken every precaution of secrecy; if a medical practitioner believes that his patient has broken the law, his professional respect for her confidence debars him (except in the event of death) from informing the police—indeed, even if he were at liberty to make disclosure, he has usually nothing but suspicions to communicate. Suspected abortion is one of the causes of death for which the registrar must watch vigilantly with a view to referring the case to the coroner. The medical practitioner's certificate or refusal to certify may be significant, but we can hardly hope that the Registrar-General will be able to furnish us with exact or trustworthy statistics from this source. If the recent speakers are right, the law is being broken freely and with

npunity. Competent judges aver that the law in self is adequate; it is the enforcement which is at ault. Some reformers would welcome a more igorous attack upon the traffic in abortifacient rugs. They point to the shameless and unrestricted dvertisement of preparations which claim to "remove ll female obstructions, however caused," and which, s LORD RIDDELL has observed, must be either auds or abortifacients. They advocate the suppression of such advertisements by statutory prohiition for which a precedent exists in the Venereal)isease Act of 1917; this is a matter which might ell be pressed upon the attention of the Home)ffice. Another suggestion, to restrict the use and upply of lead and other abortifacient drugs by xtending the schedules of the Poisons Act and)angerous Drugs Act, requires more caution. Many rugs used for the purposes of abortion are also equired for purposes entirely innocent. Moreover, o make drugs less easy to obtain may merely have he result of driving abortionists into a more frequent se of instruments or electrical treatment. The resent difficulty of enforcing the law is significant; ould a more rigorous law obtain better results? he prospects of improved legislation must certainly e explored, but too much is not expected of an ct of Parliament.

No remedy will succeed without the support of ublic opinion, which for this purpose means largely he opinion of women. Does public opinion condemn bortion as vigorously as heretofore? Those who re in a position to know tell us that women, married nd unmarried, demand abortion often without being onscious of any moral or legal offence. Birth control, owadays canvassed without the old reserve, is ssentially distinct from abortion; but the change of iew towards birth control may be a symptom or an ncouragement of other changes. Are we coming o a time when prudential considerations will be eemed to justify the interruption of pregnancy, t any rate in its early months, as though this were nerely an extended form of contraception? Soviet Russia has legalised abortion upon condition that a nedical commission approves and that the operation s performed by a doctor in a public hospital. What re the consequences to the health of the mother nd to infant mortality? We lack the positive nowledge which would provide a medical contriution to a moral question; the pursuit of evidence s distracted by non-medical issues. Yet it is to the nedical profession that the public will look for uidance. At present, unfortunately, some reformers ook askance at that profession, accusing it of shielding he abortionist by maintaining its ancient tradition of ecrecy.

Annotations.

"Ne quid nimis."

THE KING'S HEALTH.

IT is significant that the bulletin issued on Friday f last week was the first official intimation concerning he health of the KING that had been made public for our days, and the abatement of perpetual anxiety vas at once recognised. That bulletin informed us hat, while improvements previously noted continued, acteriological examination showed the right chest o be free of the infecting organism. On the following lay a bulletin, signed only by Lord Dawson, confirmed record of slow progress, and the one which appeared on Wednesday announced a further gain in strength. The story therefore is now one of steady improvement, although, after the ordeal which has been passed, that story may be a prolonged one. But it is legitimate to hope that the strides forward will become more rapid within the salubrious environment provided on the south coast.

THE LIGHTING OF SCHOOL BUILDINGS.

A REVIEW of the current practice of the lighting of school buildings in the United States has recently been published by Mr. James E. Ives, physicist to the Public Health Service, in which the codes of requirements specified by the education authorities in 39 of the States and 9 of the principal cities are set out. So far as natural lighting goes, the main recommendations concern the ratio of window area to floor area, unilateral or other lighting by windows, preferred exposure of windows and height of windows above the floor. The primary necessity is for the quantity of light to be sufficient, and in this connexion it must be borne in mind that the colour of the walls in the class-room must have a larger or smaller effect in absorbing the light entering by the windows. The best test is whether or not the lighting is sufficient on a dull winter's day for a normal or optically corrected eye to read the 6/6 line on the standard test-type easily at six metres. As a rule 1 sq. ft. of glass for every 5 sq. ft. of floor space is sufficient for this purpose, but this should be a minimum and it must always be remembered that the height of surrounding buildings must be taken into account. The direction of the lighting should always, where possible, be from the left in order that the shadow of the child's hand should not interfere with the light on the paper when writing. For the same reason cross-lighting and sky-lighting are undesirable. With regard to the exposure, it is rather remarkable that the majority of the American authorities prefer any aspect to a southerly one. For warm climates an east, west, or even north aspect may be preferable, but it is certainly most desirable that, if possible, the class-room during some part of the day should be bathed in sunshine. If necessary, during hot weather the windows can be shaded, and in any case the desks should be arranged so that neither children nor teachers face the windows. An important recommendation of the American authorities is that there should be a distance of from 4 to 8 ft. from the front wall of the room to the first window on the left-hand side of the class-room. It must never be forgotten that, so far as general health and mental alertness go, the nearer the conditions of the class-room approximate to those out of doors the better, and in this connexion the access of the ultra-violet rays through special glass, in cases where the expense is not prohibitive, must be recommended. The first essential for the school-room is the admission of sufficient light without the dazzling effect of direct sunlight on the children's eyes, for without sufficient light or with the dazzling effect of direct sunlight the tendency is to cause the children to stoop and develop myopia and round shoulders. While the avoidance of dazzle is of the first importance, we are of opinion that it would be mistaken policy to secure it at the expense of depriving the children of the tonic effect of direct sunlight in the school-room during some part of the day on those comparatively rare occasions when it is possible to obtain it in this country. For this it might be considered worth while to sacrifice, where necessary, an arrangement of windows which from the point of view of ocular hygiene alone might be ideal. With a little trouble it is possible to shade south windows or even sky-lights by suitably coloured blinds on a hot summer's day. With regard to artificial lighting, there is no objection to electric lights so long as proper precautions are taken against the dazzling effect of unshaded lamps which in any case should be placed well out of the ordinary line of vision.

SUBMUCOUS RESECTION OF THE NASAL SEPTUM.

TWENTY or twenty-five years ago, before submucous resection was generally adopted, deviations of the nasal septum were treated by cutting and breaking the bony and cartilaginous framework of the partition, with subsequent splinting, and by sawing off the prominence of a vomerine ridge or spur. These operations were useless for all but the more simple forms of deviation, and they did not remove the general thickening of the septum often seen in traumatic deflections; many surgeons therefore contented themselves with removing large portions of the inferior turbinal bone on the side of the convexity so as to make room round the obstruction. All these methods were often unsuccessful in curing the nasal obstruction, whilst the damage done to the nasal mucous membrane was liable to cause crusting and even atrophic rhinitis. Those who practised rhinology at that period, and remember the unsatisfactory treatment of obstruction due to septal deviations, are in a position to realise how much better are the results obtained by submucous resection—an operation which is capable of dealing with any shape of contorted and thickened septum, and of correcting the deformity without damage to the nasal mucosa, whose preservation is necessary to the proper performance of the functions of the nose.

Like other operations, however, its results are not uniformly successful, and it has occasionally suffered from the excessive enthusiasm of its devotees. Its primary object is the removal of mechanical obstruction due to deviations and thickenings of the cartilaginous and bony structures forming the septum, and in considering this indication it should be borne in mind that no one has an absolutely straight septum, and that the slighter degrees of deflection do no harm. Even considerable deviations running parallel to the path of the air-current, such as the common vomerine ridges, may cause little or no interference with respiration, and before operation it is essential to make a careful diagnosis of the cause of the obstruction, which may be vasomotor engorgement or alar collapse rather than a moderate degree of septal deformity. A good result is, of course, far more problematical when the operation is undertaken, not for obstruction, but for the relief of some more remote affection thought to be secondary to the septal deviation; among these may be instanced middle-ear deafness and the reflex disturbances believed to produce or aggravate such conditions as asthma and hay-fever. Submucous resection undoubtedly gives very great benefit in some of these cases, but great caution is advisable; for instance, it should be quite certain before operating that the deafness is of the middle-ear catarrhal type, and not due to otosclerosis, and where there is no marked nasal obstruction the surgeon must be clear that there is chronic nasopharyngeal or tubal congestion which may reasonably be ascribed to the deviation of the septum.

In the operation itself any imperfection of technique is liable to leave bad results. When the deflection extends well forwards a common mistake is to make the incision too far back, thus leaving a septal prominence opposite the narrow part of the ala. More unfortunate, because more difficult to remedy, is the removal of too much of the support of the tip of the nose. Where the deflection extends to the extreme antero-superior margin of the septal cartilage under the bridge of the nose the operation must be a compromise, some of the deflected cartilage being left in order to provide support; in severely smashed noses with much deformity a complete resection must sometimes be performed in order to provide an adequate airway, and must be followed by a plastic operation. At the apex of sharp projections, and in the corresponding receding angle on the opposite side, the mucous membrane is apt to be extremely thin, and a perforation of the septum is easily caused. In such a situation Dr. J. L. Curtin,[1] of Dublin, advises leaving a piece of cartilage attached to the top, front, or floor of the septum, whilst other surgeons place an unattached piece of cartilage between the flaps to cover a thin patch or a perforation, and find that the graft usually takes readily. Dr. Curtin also recommends that the vertical incision be prolonged upwards and backwards to give more room, and he claims that this, when necessary, is less liable to retract and to require suture than the more usual prolongation along the floor of the nose. He is strongly opposed to the use of the Killian long speculum, which, in his opinion, unduly stretches the flaps, takes all the elasticity out of the membrane, and is the chief cause of "flapping septum." Very rightly he notes that more should not be removed than is necessary to give a good result, but he will not find general agreement with his practice of removing the basal ridge with saw or chisel at a subsequent occasion. Operations at two sittings are harassing to the patient, and should only be undertaken when good results cannot safely be obtained at one.

WINTER IN MERAN.

MANY years ago the well-known geologist, Dr. C. W. Fuchs, compared the winter climate of Meran to that of summer in high Alpine valleys. From December to March the nights are like those of winter, but the days resemble those of a warm spring. Fuchs was not the first to discover the attraction of the smiling valley of the Alto Adige, protected as it is on the north by mountains more than 9000 feet in height, and falling gently to the south with a sunny exposure in which the rocks absorb the heat by day and radiate them back after sunset. Although only some 1000 feet above sea-level Meran is among the driest spots in Europe, with a clear and serene air especially noteworthy in the winter. The claims of Meran to the notice of those in search of favourable winter conditions were laid before the International Conference on Tuberculosis which took place last October in Rome; for up to the end of the eighties Meran had developed chiefly as a resort for tuberculosis. This was, of course, before the High Alps were popularised by the teaching of J. A. Symonds, Alexander Spengler, and Theodore Williams; but, although the younger and hardier of tuberculous invalids may be right in seeking the high altitude, the winter climate of Meran, as Dr. A. W. Schmidt pointed out to the Conference, is well adapted for those with weak hearts as well as for convalescents and prophylactics. Its natural attractions are supplemented by hydropathic institutes provided with baths and gymnastic apparatus and the like, while, in accordance with Tirolese practice, the living-rooms have retained their comfortable Swedish stoves after the hotels and pensions adopted the principle of central heating. It is just a century since the Bürgermeister, Josef Valentin Haller, began to lay out the town in keeping with the natural beauty of its surroundings, and that Meran has been visited by kings and queens, as may be inferred from the writings of the novelist, Paul Heyse. The Vienna bank crash of 1872, coming shortly after the opening of the Brenner railway, arrested for a while the crop of new buildings and helped to prevent the hasty modernisation which has marred many another popular resort. Dr. Schmidt draws an exhaustive comparison between the humidity, temperature, and insolation of Meran in the winter months with those of Alpine resorts and of certain places in the lowlands. He makes much of the fact that the sun temperature may reach 80°, or even 100° F., at noon in mid-winter, while the fall in the night-time and early-morning, it may be to freezing, is "absolutely of no interest for our clients." Some of the other resorts might draw other deductions from his data, but he is no doubt on safe ground in claiming a great increase of metabolism from a sojourn in Meran in the winter, which may

[1] Jour. of Laryng. and Otol., January, 1929.

eadily lead to absorption of pleuritic exudates and o retrogression of certain anatomic lesions. Wind s the great bugaboo of the subalpine resort, but while n spring and autumn violent winds may occur ccasionally for a few hours, the place is nearly ind-free in the winter months, while the soil is so orous that the scanty rain disappears quickly, and isitors can promenade dry-shod. Dr. Schmidt's omplaint is rather that these visitors find themselves o much at home in the climate that they are apt to conomise on medical advice and to behave in an rational manner, especially in regard to the wrong se of sun baths. Abuse of solar radiation has often, e says, led to harm when active pulmonary disease s present or when the epithelium of the kidneys s damaged ; in the latter case albuminuria or hæmauria may result. One of his practising colleagues, Dr. Hans Matscher, tries to put into words a sympathetic feature which makes Meran so pleasant as a ealth station. This is the happy nature of the nhabitants. The *Burggräfler*, as the native technically is called, lives and eats both wisely and well, nd likes others to do the same. It is evident that Meran should not be forgotten in the choice of a vinter resort.

"OPSONISED" SALICYLATE IN THE TREATMENT OF RHEUMATIC FEVER.

It is well known that washed leucocytes manifest no phagocytosis, but that if a drop of serum is added o them they ingest any microbes in their vicinity. Dr. Kalinin and Dr. Müller, working with Prof. S. D. Belonowsky at Leningrad, have found that he treatment of experimental orchitis by injection of a culture of pneumococci into the testis is greatly improved if optochin is added to the vaccine, nd that experimentally produced meningitis can be avourably influenced by the use of a vaccine combined with chemotherapeutic substances, such as urotropine or manganese. Levaditi has shown that bismuth acts more energetically on the spirochæte f it is previously treated with liver extract. The view that this is due to "opsonisation" of the bismuth is supported by Kritchevsky's experiments, showing that the action of salvarsan is strengthened by combining it with the serum of a syphilitic patient. Pursuing this line of investigation, Dr. A. A. Balkovsky, of Leningrad, conceived the idea of using "opsonised" sodium salicylate for acute rheumatic fever, as Prof. Belonowsky had used opsonised quinine for malaria. The experiment was made on 35 soldiers, aged between 20 and 30, admitted to a military hospital with acute polyarthritis, high fever, and general malaise. The inflammatory process moved rapidly from one joint to another; the joints affected were swollen and the skin over them was inflamed. Any movement caused intense pain, which was only relieved by narcotics, and often there was an exudation in the joint cavity. Some of the patients developed endocarditis in the first or second week of their illness. The method of treatment was as follows: Into a 20 c.cm. record syringe were drawn, first, 5–8 c.cm. of a sterile 20 per cent. solution of salicylate of soda and then 8–10 c.cm. of blood from the median basilic vein of the patient. After three or four minutes the contents of the syringe were re-injected into the vein, without removing the needle from it. No reaction was produced, provided none of the solution leaked into the subcutaneous tissues. The dose was repeated daily or at intervals of two or more days, according to the severity of the case. Many of the patients recovered after one or two injections, while others required as many as 8 or 12. No other local or general treatment was given to these patients, and—except for one case of temporary jaundice—all recovered without incident. Three-quarters of an hour after the injection they would feel much better and happier, and sleep was obtained without narcotics. The temperature usually dropped, but the pulse and blood pressure remained unaltered. On the second day after the injection a marked improvement was visible, both in the subjective condition and in the inflammatory process. During the observation period of two to three weeks there were no relapses. The method, according to its author, compares very favourably with ordinary treatment. It is absolutely harmless and in many instances served to abort an attack of polyarthritis. It limits the severity of the illness, hastens recovery, and reduces the incidence of complications. Its analgesic effect obviates the use of narcotics. Control experiments in which plain sodium salicylate was administered intravenously showed that it was, in fact, the "opsonising" process which distinguished this method from the ordinary oral administration of the drug.

POISONS IN BENGAL.

The work of an Indian Government analyst is never lacking in interest, and the annual report of the chemical examiner to the Government of Bengal for 1927 bears testimony to the extraordinary variety of material which passes through a laboratory of this kind. The diversity is particularly noticeable in the present instance because the analysis of excisable drugs was taken over from the excise department during the year, and a considerable amount of additional work has had to be undertaken on that account. Reorganisation is evidently the order of the day in the chemical department, and one result is to be seen in the addition of non-medical scientists to the staff. This change is not without a general significance, and perhaps marks the approaching end of the periods during which the doctors have been made use of for scientific duties which were not strictly medical. In view of the considerable amount of work of a non-medical nature which has now to be dealt with in a public analyst's laboratory, the innovation seems reasonable, and it is an encouraging sign of the advance of general scientific education in India that graduates in various branches of science are now readily available.

In the year under report 7557 articles were investigated by the Bengal chemical examiner's department. This number shows an increase of 536 over the previous year, and the examinations include medico-legal work, analyses of foodstuffs under the Food Adulteration Act, the standardisation of drugs, and miscellaneous analyses of various kinds. The medico-legal examinations show the usual features of an Indian list. The total number of cases referred to the department was 2112, and in a large proportion of these poison was detected. In human poisoning opium heads the list, and the next in order of frequency—apart from alcohol—are arsenic, oleander, and aconite. One body in which arsenic was discovered was removed from a funeral pyre by the police in a charred condition. This illustrates a frequent difficulty in medico-legal work amongst Hindus, whose ordinary method of disposal of the dead is by cremation, but it is noted that arsenic, though a volatile poison, has often been detected in partially burnt bodies and even in partially burnt bones. In two cases, also of homicide by strangulation, arsenic was detected in the viscera. Strychnine is a poison which is not often administered with criminal intent in India, but it is apparently a fairly frequent constituent of the nostrums prescribed by vaids and hakims, and a case is mentioned in the report in which two girls died as the result of medicine administered by an itinerant quack. Another case is brought to notice in which a woman was killed by a dose of nux vomica given in mistake for opium. Croton oil also figures in the list, but the sufferers recovered. It was apparently given with homicidal intent, and the drug was detected in the stomach wash and in some cooked pulse which had been partaken. The poisoning of cattle is a crime of frequent occurrence, and in the year under report the viscera of 111 animals were examined. Of these poison was detected in 63 cases, and arsenic was the agent in all but two. An interesting example

of accidental poisoning is cited, in which the death of two cattle was apparently traced to hydrocyanic acid in the fodder, and it is stated that other cases have been previously referred to the department in which young plants were found to contain hydrocyanic acid, probably owing to a cyanogenetic glucoside. In the present instance the plant incriminated was a species of sorghum.

Considerable advance has been made of recent years in the organisation and allocation of analytical work in India generally, and one excellent feature is the tendency to deal with public health details in separate laboratories. Bengal has now a public health laboratory, and the chemical examiner is therefore relieved of a whole department of analytical work which used to fall to his share. Another comparatively recent development is the establishment of a serological laboratory, which is now referred to frequently for blood examinations. During the year, in Bengal, 1876 articles were received for determination of blood, and of these 1018 were found by the imperial serologist to be stained with human, 3 with human and ruminant blood, and 43 with blood other than human. It is thus clear that the serological laboratory is being very freely used, and the findings of the serologist in criminal cases must often prove of great assistance to the police.

"THE LADY WITH A LAMP."

THE production of this play at the Garrick Theatre should be of great interest to the medical profession. Those to whom Mr. Lytton Strachey's essay upon Florence Nightingale, in "Eminent Victorians," is familiar will recognise how fully Mr. Reginald Berkeley, in writing the play, has followed Mr. Strachey's lead, a task which will have been rendered the easier to perform by the bibliography attached to that essay. The result is that we get on the stage a dramatic picture of a well-born and wealthy young woman, at the time when the social rules of her class were at their narrowest, determining that she had the right to follow the dictates of her highest self, and to defy all those rules, whatever pain and even humiliation such conduct might cause her family circle. In the play the mystical side of the influences which drove Florence Nightingale from the ball-room to the ward, and from marriage to the abnegation of all sex ties, is developed with great delicacy, while the hard-headed manner in which she carried out her gigantic policy of reform, when her emotional impulses had been transmuted into practical schemes, is also well displayed. There is, we assume, some historical justification for the suggestion that it was Palmerston's personal advice that induced Florence Nightingale, driven by her inmost conviction that her services would later be required, to train herself as a nurse, for in no other way could training be obtained. By sheer determination she acquired hospital experience and came to understand the principles of administration and sanitation as they were accepted 75 years ago. And by sheer intelligence she arrived at where those principles were wrong and where the principal needs of reform lay. Whether the author is accurately documented in the passages where Palmerston reveals, under his flippancy, a complete comprehension of Florence Nightingale's high purpose, and gave her the counsel that she needed, we do not know, but a fine dramatic situation is thus presented. The episodes in the play which have no historical derivation do not intrude on the central theme—the story of a task performed with a courage sparing neither of friends, of foes, or of self—and both the tragic love-story of the heroine, and the relations between her an and excusably jealous wife, are written finely and acted with the skill and distinction that were called for. If the main honours accrue to Miss Edith Evans, Miss Gwen Ffrangcon-Davies and Mr. Leslie Banks, who perhaps played more difficult parts, deserve high credit for their skilful impersonations, while Miss Muriel Aked, as Mrs. Nightingale, was delightful. The introduction of the word "antiseptics" at the period of the Crimean War is an anachronism.

STUDY OF HEREDITARY DISEASE.

THE association between blue sclerotics and a tendency to spontaneous fracture of bones was first recognised by J. Spierway some thirty years ago. He described a family of which four generations had had brittle bones, and observed that a feature common to many of its members was "a curious bluish tint of the eyeball." Working for the Nettleship Memorial Volume [1] on anomalies and diseases of the eye, Dr. Julia Bell has delved deeply into the literature, has discovered no less than 448 recorded cases of blue sclerotics, 200 in males and 248 in females, and has enlivened the subject with a keen perception of the less obvious corollaries of this curious association of abnormalities. Dr. Bell's ingenious comments have indeed put new life into dry bones. Few would look in a work on pedigree plates for such illuminating reflections on the apparent sex-incidence of hereditary diseases as are here supplied. In most of these there is, as is well known, a male preponderance; in fact, such diseases as hæmophilia and congenital dichromatism have given an impression that the male is peculiarly liable to be the victim of hereditary disease, and the female peculiarly potent as a transmitter. There is no known defect which affects only the female, but where as in most of the hereditary diseases males predominate, there seems to be a definite excess of female among the population affected with blue sclerotics. Achondroplasia and chronic trophedema are also exceptional in this respect, according to the pedigrees to which Dr. Bell has had access, but the numbers affected are too small to give any more than an approximation of the sex-incidence. Moreover, they may be misleading for other reasons. Sex-incidence of a disease, as Dr. Bell points out, is influenced by a great variety of factors differing from one disease to another, and any particular value may have little or no relation to the inherent relative liability of each sex to show the disease. The discussion of the sex-incidence of achondroplasia is an example of the complex factors which must be considered in an inquiry of this kind. The low value of the male sex-incidence of achondroplasia may be due to the fact that, the size of normal male heads at birth being anyhow larger than that of female heads, the exceptionally large heads of achondroplasic males lead to a selected infant mortality, with the result that a larger number of achondroplasic females survive birth. Possibly, on the other hand, there may be quite a different explanation—i.e., that, driven by obstetric difficulties, more adult females than adult males present themselves for treatment; this would lead to selection in the cases which come under observation. The values might be also affected in the other direction by such factors as concealment on the part of the female of a defect which might be regarded as a bar to marriage. But have we any evidence that the defect in the female is really a bar to marriage and that this factor does not operate for the male? A defective male might be expected to seek marriage in order to make sure of having somebody to look after him when disabled; moreover, a woman's maternal instincts might tend to draw her to mate with one who needed physical aid, and she might marry a disabled man in order to look after him.

In such intricate arguments do we become involved when the real meaning of an apparent difference in sex-incidence of hereditary defect has to be ascertained, and it may be readily imagined

[1] Eugenics Laboratory Memoirs, XXIV. The Treasury of Human Inheritance. Edited by Karl Pearson, F.R.S. Vol. II. Anomalies and Diseases of the Eye. Nettleship Memorial Volume, Part III. Blue Sclerotics and Fragility of Bone. By Julia Bell, M.A., M.R.C.P. 1928. London: Cambridge University Press. £1 16s.

hat only immense experience in evaluating tatistical data enables workers on such dangerous round to avoid pitfalls. This applies to any tatistical investigation, and it is becoming obvious hat while the collection of data may be entrusted to ny careful observer, they may need to be inter- preted with the help of those who, like Dr. Bell, re devoting their lives to such studies. In this onnexion, a book recently published by Dr. J. S. Manson [2] is of especial interest. This small volume onsists of a series of chapters, giving examples of pedigrees of hereditary disease in man, the major part of which have been already published elsewhere. The author, a busy practitioner, is to be congratulated on a valiant endeavour to add to the material avail- able for use by the student in heredity. All will agree with him that accurate and tabulated observa- tions of the progeny of human matings with distinctive characters should prove as valuable to the study of heredity as devised experiments on animals; this is after all the only real method in forming definite conclusions as to the working of genetic laws. The labour involved in the collection of information to form such pedigrees as those given for lamellar cataract and hereditary syndactylism and polydac- tylism must have been very great, and the value of such contributions to the collections of family histories on the subjects is undeniable. Having given this service, the author proceeds to a discussion of the material; such a discussion can only be of value if it is based on an analytical treatment of all available cases, of which he admittedly has no know- edge. Dr. Manson publishes one or two pedigrees of each of 14 different hereditary conditions. Those who have studied some hundreds of pedigrees of one condition hold that very little can be learned from a single pedigree, and that it is unwise to make any statement as to the hereditary character of any defect on such evidence. Moreover, an exhaustive knowledge of the literature of the subject is necessary before the general aspect of such complex phenomena can be understood. The fact remains that the data so carefully collected are of the utmost value. It is obvious that in medicine progress is retarded for lack of reliable statistics, and a prac- titioner who, like Dr. Manson, is willing to use his leisure in collecting such valuable material and pre- paring it for publication in readily accessible journals deserves hearty thanks. He spared himself no trouble in his endeavour to make his information of cases as complete as possible and has provided a number of very good plates, which admirably illus- trate the nature of the condition when this is possible.

LEPROSY IN MEXICO.

A VOLUME [3] of 501 pages contains the results of an attempt by the Government of Mexico to arrive at an estimate of the number of lepers within their borders. But unfortunately such an effort was fore- doomed to failure by the conditions which the compilers themselves describe.

According to the returns, only 1333 of the 2272 municipalities in Mexico have any resident medical men, and in addition there were no returns from 423 officials who should have given particulars of the doctors or hospitals in their areas. Of the 286 hospitals and medical institutions to which circulars were addressed not two-thirds sent answers, and replies were received from only just over half the 2756 doctors to whom application was made. It is necessary to insist on these figures because only thus is it possible to realise that the volume has no value for purely scientific purposes; it is impossible to make any trustworthy deduction from a census which on the compilers' own showing covers less than seven million out of 15 million inhabitants (p. 499). The figures given no doubt have a certain value for administrative purposes; they indicate to some extent the magnitude of the evil with which the authorities have to grapple, and show some of the principal foci of the disease in the areas covered. But it is unfortunate that the editors should have treated them as if they were complete and made a map which, while purporting to show the relative distribution of leprosy in the various provinces, can only mislead those who are not acquainted with the facts. In the province of Oaxaca, for instance, only 8 per cent. of the population are even supposed to be covered by the inquiry, and it is stated (p. 277) that the actual conditions do not allow of an inquiry of this character; yet this province is entered on the map as having from 1 to 50 cases of leprosy. It may be said in conclusion that the figures, for what they are worth, show 1450 lepers in the areas covered by inquiry, of whom 734 showed the nodular form, 262 the nervous, and 283 the mixed, whilst in the rest the form was unknown. Only 27 of the lepers were foreigners, 15 being Asiatic. The statistics have been carefully analysed and perhaps the most important practical point is that lepers were found in every profession and occupation, an evil which stricter enforcement of existing laws could apparently stop. Leprosy is clearly endemic in Mexico to a considerable extent, doubtless much greater than is here indicated, and the census report, though it does not deal with measures of prophylaxis, is a satis- factory indication that the authorities are alive to the urgency of the problem.

[2] Observations on Human Heredity. With 8 plates and 19 illustrations in the text. By J. S. Manson, M.D. Edin., D.P.H. Manch. London: H. K. Lewis and Co., Ltd. 1928. Pp. 84. 6s.

[3] Primer Censo de Lepra Departimento de Salubridad Publica, Mexico, 1927.

HERPES AND VARICELLA.

EVERYONE who tries to find out what has been written on the relation of herpes zoster to chicken-pox will agree with Dr. A. Wallgren [1] that the literature needs pruning. But his own contribution, comprising some personal observations together with a review of recent Scandinavian papers, is a sound outgrowth from this large tree, and his dozen cases are scrupulously recorded. They formed a little epidemic of herpes and varicella in a children's ward at Göteborg, and he regards them as undoubtedly showing an ætiological bond between the two diseases. This relationship may be twofold: first, herpes zoster may be identical with chicken-pox; and, secondly, one may provoke the other or predispose to it, just as measles is said to predispose to whooping-cough. Very interesting are Wallgren's notes on the power of visceral and glandular tuberculous lesions to provoke a herpetic lesion at a corresponding segmental level—an occurrence of which he gives characteristically minute records. In calling for more information on the association of herpes and other diseases he urges the necessity for strict and conclusive investigations concerning incuba- tion periods and absence of previous attacks. Some accounts of their coincidence, as he says, do not ring true, and there are both clinical and experimental observations opposing any relationship. He fairly quotes the quaint remark of Comby, after some of this latter work, that chicken-pox can no more be produced by herpes zoster than a chicken can be born from a duck's egg. Incidentally, whilst stating that studies on the subject go back 37 years to von Bokay, he does not mention that it was A. J. Harrison, President of the Dermatological Society of London in 1900, who urged that certain cases of herpes zoster are manifestations of acute specific infectious exanthemata.

A COPIED PRESCRIPTION.

A VERDICT of death by misadventure was recorded a few days ago by the Hammersmith coroner at the inquest on a man who died in a London nursing home from an overdose of paraldehyde given as a pre- liminary to an operation, the error being due to the faulty copying of a prescription. The patient was a man 44 years of age who had taken the same

[1] Acta Pæd. Scand., 1928, viii., 241.

anæsthetic previously for severe dental extraction and was well pleased with the result. The intention of the anæsthetist was to administer by the rectum 9 drachms of paraldehyde—that is to say, the customary 1 drachm per stone of body-weight—in 5 ounces of olive oil, and in accordance with the practice at the nursing home his prescription was copied by a nurse before being sent to the pharmacist. The instruction, as the latter received it, was to send 9 ounces of paraldehyde and 5 ounces of olive oil, and there was nothing on the copied prescription to indicate that these were to be given in combination as a single dose. Paraldehyde, as the pharmacist stated in his deposition, is not scheduled as a poison or as a dangerous drug. He was at liberty to sell it in large quantities to anyone, and may readily have believed that the prescription was intended for stock. It is reasonably clear, however, that the mistake would not have occurred if the original prescription as written by the anæsthetist had actually reached the dispenser who was a qualified chemist and druggist. Even should there have been any doubt as to whether the Arabic sign was intended to represent a drachm or an ounce, the dispenser must have realised that he was being asked for a single narcotic dose prescribed for a particular patient, and his knowledge would then have prevented him from supplying a quantity of paraldehyde which he would recognise as being highly unusual if not actually dangerous. The lesson of the tragedy seems to be not so much the difficulty of deciphering doctors' prescriptions—in this case we have every reason to believe that the prescription was correct and clearly written—as the avoidance of introducing an element of risk by interposing a third party between the doctor's wish and its execution by the pharmacist. Both the doctor and the patient are well served by the pharmacist's experience in interpreting prescriptions, and no prescriber would be willing to forgo the safeguard of the dispenser's expert and often critical eye. In this case no individual seems to have been to blame. The disaster was the outcome of a long-standing tradition in a nursing home, which, however inadvisable, had not previously led to any doubt or difficulty. It is, however, just as well that this aspect of the lesson should be enforced in order that nothing of a similar nature should recur.

THE BRITISH SOCIAL HYGIENE COUNCIL.

WHEN the Local Government Bill becomes law the British Social Hygiene Council will be faced with the loss of its Government grant. By a clause passed this week official donations to this body are to be a matter for the local authority to determine, although the Ministry will give every encouragement to county and borough councils to subscribe. An amendment to make the grant compulsory failed to secure the support of the Minister or the approval of the House. It was strongly supported by Dr. F. E. Fremantle, who did not agree with the Parliamentary Secretary to the Ministry of Health that this propaganda work could now be undertaken by the local authority, and who quoted figures to show that only very small sums are at present allocated by these bodies to the prevention and control of venereal disease. He was of opinion that they were, in fact, entirely dependent upon the Council and its organisation in any work they undertook, and that the problem had not yet really got down to the individual conscience of the population. He feared that without the prestige and practical assistance of a Government grant the movement would fade away, and he reminded members of the pioneer work of the Council in the early days of its foundation—as the result of the recommendation of a Royal Commission. At that time venereal disease could not be named in the press, in the House, or in the reports of medical officers of health, and there was no machinery for dealing with the problem. The Minister of Health cordially agreed that the work of the Council had been invaluable, but maintained that local authorities to-day were alive to the importance of venereal disease propaganda, and that they must be left free to approve the activities they would support. The only comfort he could give the friends of the Council was a promise that he would urge on local authorities the importance of financing a central body, and an assurance that he personally hoped for the continued and increasing activity of the Council. Only experience can show whether or not he is justified in his belief that the Social Hygiene Council will be able to continue its valuable work under the new conditions. All who know its history and progress will hope that it may. Under enlightened guidance the Council early realised that the problem of venereal disease was not to be solved by direct attack or negative means, but that a campaign of education and stimulation of the moral conscience of the Empire was the only fruitful procedure. The thirteenth annual report, recently published, tells the story of widespread activities, including every part of the dominions. Health weeks and lectures of all kinds are organised, conferences are arranged, and work is carried out in connexion with other national societies. The diminution in the incidence of syphilis does not, therefore, constitute any argument for curtailing the work of the Council, and even in the more limited field of venereal disease there is urgent need, as the report points out, for more facilities for diagnosing and treating antenatal cases and for the in-patient treatment of gonorrhœa. Biological education is of particular value in relation to sex conduct, and instruction in social hygiene is a work that no civilised community can afford to neglect.

PREVENTION OF HAY-FEVER.

IN a Statistical Report on the Treatment of Hay-Fever, Dr. M. A. Ramirez,[1] of New York, describes a study of 425 cases of this condition treated by injection of pollen extracts. He prefers to call hay-fever "pollen rhinitis," and begins his paper with a brief description of the scratch and intradermal methods for the diagnosis and detection of the pollen responsible. The best results in treatment, he says, were got when patients came about three months before the expected paroxysm. In these a fortnight's intensive course of injections of the appropriate pollen extract was given at once. The dosage was rapidly increased and injections continued up to the pollen season, during which they were given twice weekly. This form of prophylaxis was supplemented by administration of autogenous vaccines prepared from the nose and by nasal application of solutions of pollen extract. In addition, local treatment of the nose with the Kromeyer lamp was often found advantageous. Neither autogenous vaccines, nor local application of pollen solution were found of any value by themselves, though they were helpful in cases being treated by injection. Ramirez urges that the largest possible doses of pollen extract should be given for several months before the pollination season and that massive doses should be continued until it is over.

Dr. Francis de Havilland Hall, who died of pneumonia, after a week's illness, at Twickenham on Sunday last, in his eighty-second year, was consulting physician to the Westminster Hospital, and had examined in medicine for the Royal College of Physicians of London and the University of Durham.

A FORTNIGHT ago we commented in these columns on the attention drawn by the Ministry of Agriculture and Fisheries to the growing demand existing throughout the British Empire for men trained in biology. This matter is at present being debated by a joint committee at the Universities Bureau of the British Empire, where the discussion takes the form of examining into the practical steps which might secure the development of the teaching of biology by cöoperation between the universities and secondary schools.

[1] Amer. Jour. Med. Sci., 1928, clxxvi., 856.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XX.—THE SIGNIFICANCE OF OCULAR TESTS.

PART I.—MONOCULAR TESTS.[1]

VISUAL tests fall into two groups: (1) monocular, (2) binocular.

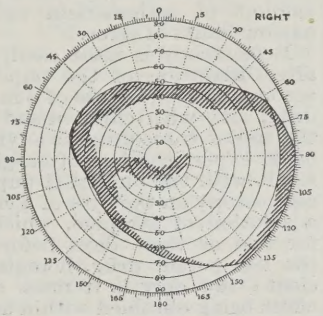
Monocular tests are carried out on each eye separately, the other being screened off. In considering tests for visual acuity it must be remembered that the central fixation point, an extremely circumscribed area of the retina, is endowed with acute perceptive power, and that immediately outside this area retinal perception falls away steeply towards the periphery. So great is this difference that entirely different tests are used for central and peripheral acuity of vision.

Snellen's types.—The standardised test for central acuity of distance vision consists of the familiar Snellen's types, a series of black letters of diminishing sizes arranged on a white ground, and placed at a uniform distance of 6 metres from the patient. Each row of letters from above downwards is of a size which should be readable at a certain definite distance, the large letter at the top at 60 metres, the second row at 36 metres, the fifth row at 12 metres, the seventh at 6 metres, this last being the normal standard. Acuity is expressed by a fraction, the numerator indicating the distance from the types, and the denominator the distance at which a person of normal acuity should be able to read letters of the smallest size which the patient can read.

Diagrams of Pathological Visual Fields.

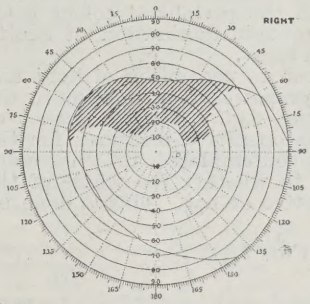
In each case the shaded part represents the blind area.

FIG. 1.



Right field from a case of chronic glaucoma showing a paracentral scotoma joining with a blind area in the nasal field. The field is contracted peripherally.

FIG. 2.



Field from a case of detachment of the lower part of the retina in the right eye.

Normal vision is expressed as 6/6—that is, the patient can read at 6 metres what he ought to read at that distance. If he can read only the top letter his vision is 6/60; if the second row, 6/36; and if the fifth, 6/12. 6/6 vision is merely an average standard of good acuity, and most normal eyes can read even smaller letters at 6 metres distance, the acuity being 6/5 or even 6/4.

Obviously, unless care is taken to correct any existing refractive error which interferes with vision by a suitable lens, this test does not show the actual efficiency of the eye.

Jaeger's types.—For testing acuity of near vision, Jaeger's types, which are ordinary printers' types of different sizes, are commonly used. The distance from the eye at which the type is held, as well as the actual size which can be read, must be taken into account. Myopes will hold the type close to the eyes, and the higher degree of myopia the nearer will it be held. Normal-sighted persons and hypermetropes who have reached middle age will, on the contrary, tend to hold the type far away, the distance increasing as age and its attendant presbyopia advance. A tendency to hold the book close to the eyes is not, however, invariably due to the presence of a myopic error. It is commonly met with in children, especially those to whom reading does not yet come easy, and is due to an instinctive effort to see the type as clearly as possible; the nearer the book is held the larger is the image of the type formed on the retina, and because the accommodative power of the eye decreases as age advances, and is much greater in childhood than in adult life, the young eye can focus objects at a closer range than is possible later on in life. In prescribing glasses the question of normal reading distance is of great importance; only a correction which will ensure this can be worn with comfort.

Perimetry.

The measurement of visual acuity in the peripheral field outside the central fixation point is known as perimetry, and is carried out by determining the power of perception of movable objects of graduated sizes in various parts of this field, while the patient directs his gaze steadily towards a fixed point. For this purpose many different devices and instruments are used, but in all of them there must be a fixed central object and a rest, or appliance, for keeping the head in a steady position during the examination.

The test objects consist of white and coloured squares or discs of various sizes. A perimeter is an instrument consisting of a fixed upright to which is attached a movable curved arm, the latter forming the arc of a circle along which the tests object may be moved, either mechanically or by hand, so that the area tested may be measured and recorded on a chart marked in degrees radially and concentrically, with the fixation point as centre. Alternatively the field of vision may be tested on a flat screen (Bjerrum's screen), the test objects being mounted on holders, and moved about at will.

The Interpretation of Blind Areas.

The interpretation both of blind areas (scotomata) and of areas of lowered sensibility in the field of vision is of very great importance in the diagnosis of lesions in the nerve path of visual impressions. The characteristic changes which occur throw light both on the position and nature of such lesions, whether in the nervous elements of the eye itself or in the path to the visual cortex. Chronic glaucoma is an outstanding example of nerve derangement in the eye itself, in which the field changes are all important in early diagnosis. In this condition abnormal pressure on the optic nerve-fibres at their point of exit from the eye causes them to atrophy, and their destruction is selective in the early stages of the disease as regards different parts of nerve. This selective destruction shows itself in the field of vision as blind areas; these correspond to the distribution of the atrophied fibres, and usually appear first in the neighbourhood of the blind spot and in the nasal field (Fig. 1), while preservation of central vision is possible in association with considerable paracentral and peripheral loss of field.

In cases of localised detachment of the retina perception is lost, or greatly diminished, over the area of the detachment, which becomes manifest as a blind area in the field of vision (Fig. 2); this is an extremely valuable adjunct in the detection of small peripheral

[1] Part II., on Binocular Tests, will appear in THE LANCET next week.

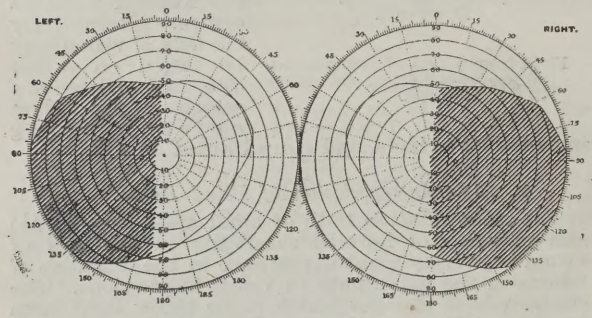
detachments, and in the measurement of increase or decrease in the area of a detachment.

Hemianopia.

Again, the relative arrangement of the nerve-fibres in the paths conveying visual impressions to the cerebral cortex corresponds with that of the retinal surface, and this arrangement is also reproduced in the visual cortex itself. Also the nasal half of one retina and the temporal half of the other is represented in each hemisphere and in each optic tract, for which reason blindness involving half of each visual field (hemianopia) is a common accompaniment of lesions affecting these structures. The hemianopia involving the temporal half of each field (bitemporal hemianopia, Fig. 3), caused by pressure of a pituitary tumour on the inner parts of the optic tracts in the neighbourhood of the chiasma, and the hemianopia involving corresponding temporal and nasal halves of each field (homonymous hemianopia, Fig. 4) which arises from destruction of the occipital cortex of one hemisphere, will serve to illustrate this. Normally the extent of the peripheral field over which colours can be perceived is different for each colour, and pathological disturbances in colour perception, whether central or peripheral, are of great significance. For example, in cases of tobacco blindness central perception of red and green is diminished early in the disease and abolished in the later stages; also in cases of retrobulbar neuritis central perception of red and green is lost. With the hemianopias of pituitary enlargement changes in the peripheral colour fields accompany and may precede diminution of acuity for white in the affected areas.

When vision is reduced to perception of light and shadow, owing to the presence of an opacity in the anterior part of the eye—e.g., a dense cataract or closed pupil—and when operative measures for the restoration of sight are contemplated, it is necessary to form an opinion as to whether the whole of the retina is likely to be active or not. This is done by

FIG. 3.



Fields from a case of pituitary tumour, showing bitemporal hemianopia.

directing light upon the eye by means of a reflecting mirror from all directions in turn. If the retina be normal the patient will be able to "project" the light to its source—in other words, will point quickly and accurately to the mirror in each separate position.

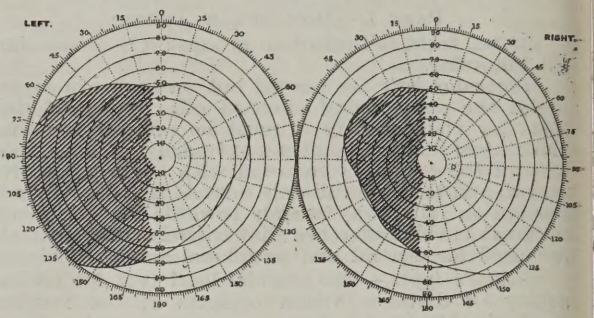
Measurement of Refraction.

The basic test for measurement of refraction is retinoscopy (or skiascopy), which is purely an objective one. It is performed by throwing light into the patient's eye by means of a mirror so that the light is reflected back from his fundus, making the pupil appear luminous to the observer. The mirror is then tilted slowly so that its reflected light gradually moves off the patient's pupil, the direction of this movement being meanwhile observed.

In emmetropic and hypermetropic eyes the rays of light emerging from the pupil of the eye under observation are parallel and divergent respectively, are reflected directly from the fundus, and will move off the pupil in the opposite direction to that seen in myopic eyes, in which the rays of the emergent beam cross and form a real image before meeting the observer's eye, this real image taking the place of the fundus as the source of light.

By determining the strength of lens necessary to obtain reversal of the direction of movement in each

FIG. 4.



Fields from a case of tertiary syphilis, showing homonymous hemianopia, the result of pressure from a gumma on the right occipital cortex.

case, the refraction of the eye and the existence and amount of astigmatism can be estimated within narrow limits of error.

Retinoscopy is most easily and quickly performed after dilatation of the pupil and inhibition of the accommodation by use of a mydriatic and cycloplegic drug, and with children and young adults especially the use of these drugs is advisable; but in the hands of an expert the test often gives an equally accurate result with the undilated pupil. Before performing a retinoscopy on the eyes of a child it is usual to employ a solution of atropine, which is instilled twice daily for two or three days beforehand, but in an adult the less potent drug, homatropine, is generally sufficient; not only is it more rapid in action, the full effect being obtained within an hour after instillation, but its time of action is much less prolonged than is the case with atropine.

The indiscriminate use of mydriatics in middle-aged and elderly people is extremely dangerous, owing to the possibility of determining the onset of an attack of acute glaucoma in a predisposed person by dilatation of the pupil. For this reason careful examination of the eye must always be made, special attention being paid to the depth of the anterior chamber before any mydriatic drug is instilled.

The test is followed by a subjective one, based upon the objective findings, Snellen's types being used; other subjective tests may also be employed—for example, charts showing radiating lines (astigmatic fans) may be used as aids in the determination of the axis of astigmatism. An ingenious application of the difference in wave-lengths of colours at opposite ends of the spectrum has recently been devised. This "Duochrome" test consists of two strips of letters, each on an illuminated transparent ground, one red and one blue. The short hypermetropic eye sees the blue more clearly, and the long myopic eye the red, and the test is carried out by equalising the clearness of the colours with lenses of appropriate strength.

R. AFFLECK GREEVES, F.R.C.S. Eng.,
Surgeon to Moorfields Eye Hospital; Ophthalmic Surgeon to the Middlesex Hospital.

HOSPITALS AND STREET ACCIDENTS.—In his first annual report Dr. J. N. Deacon, medical superintendent of the Hendon Board of Guardians' Hospital at Redhill, Edgware, states that of 313 urgent admissions for treatment of injuries 270 were the result of street accidents. These 270 cases "cost the ratepayers of the Hendon Union something in the region of £4000."

Special Articles.

MEDICAL EDUCATION OF WOMEN UNDERGRADUATES.

REPORT OF THE UNIVERSITY OF LONDON COMMITTEE.

A COMMITTEE of the University of London was constituted on March 21st, 1928, to consider the question of the limitations placed upon the medical education of women undergraduates and to report to the Senate thereon. Its members were Sir William Beveridge (then Vice-Chancellor), Prof. S. L. Loney (chairman of Convocation), Prof. L. N. G. Filon, F.R.S. (chairman of the Academic Council), Dr. Graham Little (chairman of the Council for External Students), Sir Holburt Waring (chairman of the Finance Committee), Dr. W. P. Halliday (principal of King's College), Dr. W. R. Matthews (Dean of King's College), Mr. Walter Spencer, Miss E. Strudwick (principal of St. Paul's School for Girls), Sir Andrew Taylor (chairman of the Managing Committee, University College), and Miss M. Tuke (principal of Bedford College for Women). Sir William Beveridge acted as chairman. The committee had 11 meetings, on March 23rd, May 4th, 14th, 18th, and 21st, June 7th, 15th, and 26th, Dec. 19th, 1928, and Jan. 15th and 23rd, 1929. At the request of the committee the meetings were attended by the Academic Registrar, who prepared a statement and furnished statistics for their information. At some of these meetings representatives of certain of the medical schools and others interested in the question were interviewed, including the Women's Medical Federation, and the Vice-Chancellor convened a meeting of representatives of all the medical schools, which was also attended by the Chairman and the Academic Registrar. The committee express appreciation of the assistance given in the inquiry by the medical schools. It was thought desirable that they should express their views in the frankest possible manner, and an undertaking was therefore given that their statements of opinion would not be published. Certain statistical information furnished by the schools is also unpublished, but in an appendix other statistical material is set out which had a bearing on the conclusions arrived at.

A number of communications and resolutions were received from Convocation and from various other bodies, including the following: the Six Point Group, the National Council of Women of Great Britain, the Council of the League of the Church Militant, the Women's Freedom League, the Executive Committee of the Association of Head Mistresses, the Women's League of New South Wales, the Women in the Service of Hospitals Joint Committee.

After setting out this general information the committee proceeded to report as follows:—

MEDICAL CURRICULUM.

It is perhaps desirable that we should state in the first instance the nature of the medical curriculum.

The course leading to the first degree in Medicine (M.B., B.S.) extends over a period of five and a half to six years, of which approximately half is devoted to pre-clinical and half to clinical studies.

The pre-clinical studies are divided into stages. The first ends with the First Medical Examination and comprises physics, chemistry, and biology. This examination is taken by a number of students at school before coming to the University; the Intermediate B.Sc. Examination is also taken by a considerable number of students (principally at University and King's Colleges) in lieu of the First Medical Examination. The second stage of the pre-clinical studies leads to the Second Medical Examination, which itself has two sections; Part I. comprises Organic Chemistry, and Part II. Anatomy, Physiology, and Pharmacology.

After a student has passed his pre-clinical examination, he enters a hospital medical school for his clinical courses which include medicine, surgery, midwifery, pathology, and the various "specialties." After the conclusion of the three-year clinical course the student proceeds to the M.B., B.S. Examination. It may be noted here that the clinical courses provided at most of the London hospital medical schools are designed to cover the needs of three types of students: (1) students working for degrees of the University of London; (2) students from other universities who come to London for clinical studies leading to degrees of those universities; and (3) students preparing for diplomas, such as those of the Conjoint Board (M.R.C.S., L.R.C.P.). The clinical courses for these three types of students are substantially the same.

COLLEGES AND SCHOOLS PROVIDING MEDICAL COURSES.

The following colleges and schools provide courses, pre-clinical, clinical, or both:—

Incorporated Colleges of the University.—University College and King's College provide complete pre-clinical courses.

Schools of the University.—(*a*) *General Schools.*—East London College provides courses for the Intermediate B.Sc. Examination.

(*b*) *Medical Schools.*—Complete courses are provided at St. Bartholomew's Hospital Medical College, St. Thomas's Hospital Medical School, Guy's Hospital Medical School, London Hospital Medical College (first pre-clinical course taken at East London College), Middlesex Hospital Medical School, London (R.F.H.) School of Medicine for Women, and St. Mary's Hospital Medical School. Clinical courses only are provided at Westminster Hospital Medical School, St. George's Hospital Medical School, Charing Cross Hospital Medical School, University College Hospital Medical School, and King's College Hospital Medical School.

Prior to the war all the medical schools, with the exception of the London School of Medicine for Women, which was founded for women only, were restricted to men, but during the war this policy was modified in several cases.

In 1916 *St. Mary's Hospital Medical School* undertook to receive for clinical studies women from the London School of Medicine for Women only. In the same year *Charing Cross Hospital Medical School* admitted women "on the same terms as men," and *St. George's Hospital Medical School* agreed to admit women up to the number of ten during the continuance of the war.

In 1917 *Westminster Hospital Medical School* admitted women, but it does not appear that this decision was formally communicated to the Senate.

In May, 1918, the *London Hospital Medical College* informed the Senate of their intention to admit women on the same terms as men. The Senate then stated that the step was "in entire conformity both with the wishes and the policy of the University."

In June, 1918, *King's College Hospital Medical School* resolved to admit women and the Senate made a similar pronouncement.

In July, 1918, *University College Hospital Medical School* decided, in the event of the Senate approving certain arrangements with other institutions, to receive women, and the Senate, when agreeing to these arrangements, stated that they "learnt with gratification of their proposals."

By July, 1918, then, clinical facilities were available for women at seven of the medical schools in addition to the London School of Medicine for Women. Four of the men's schools, St. Bartholomew's, Guy's, St. Thomas's, and Middlesex, had made no change in their traditional policy. At this date, of the 12 medical schools providing clinical courses in London four were confined to men, one was confined to women, and seven were open to both sexes. The relative extent of medical co-education was less than these figures would suggest in so far as the co-educational schools were generally smaller than the others.

After the war the position began to alter.

St. George's Hospital Medical School ceased in 1919 to admit any more women, although the Senate does not appear to have been officially informed. In November, 1921, the authorities of the *London Hospital Medical College* stated (S.M. 1189 of December, 1921) that they had "formed the opinion that the interests of both institutions (College and Hospital) are adversely affected by the continuance of co-education, and have therefore decided to limit admission to men students only in the future." In 1924 *St. Mary's Hospital Medical School* decided to admit no more women students; here also the Senate does not appear to have been informed. Nor has the Senate been informed, although it is a matter of common knowledge, of the decision taken in

1928 by Charing Cross, Westminster, and King's College Hospital Medical Schools to discontinue the admission of women students in the future.

The effect of this change of policy is that there are at the present time two schools only which offer clinical facilities to women—the London School of Medicine for Women, and University College Hospital Medical School, which, since 1921, has admitted 12 women a year—eight on the nomination of University College, and four by examination.

It may be pointed out that it is the withdrawal of facilities for *clinical* instruction only which has given rise to the present inquiry. The facilities for *pre-clinical* instruction for women are ample. There has been no change of policy regarding the admission of women to University College and King's College for pre-clinical courses, and these Colleges with East London College (which are all co-educational) could continue to provide for the needs of such women as are likely to present themselves for some years. The fact, however, that there may be difficulty in finding clinical facilities subsequently must inevitably affect the number of entrants for pre-clinical courses.

PREVIOUS INQUIRIES.

During the war the Academic Council, who were anxious regarding the adequacy of clinical facilities for Women, appointed (in December 1915) a subcommittee with the following terms of reference :—

"To consider the present provision of facilities for the medical education of women in London; whether these facilities are adequate; and if not adequate, what means should be adopted with a view to extending them."

The subcommittee held 12 meetings and interviewed 28 witnesses, including the deans of the medical schools. The report of the subcommittee dealt at some length with the general question of co-education for women, including the opening of the Anatomical Departments of University and King's Colleges to women. On the general question the subcommittee states (paras. 13 and 15) :—

"It has been urged that medical women cannot acquire the necessary self-confidence and responsibility unless they see in their daily work other women occupying responsible positions on the same terms as men; and looking at the question from another point of view, it has been pointed out that if all the medical schools in London were opened to men and women alike the number of women students in most of them would be insufficient to provide the students with that social and corporate life which is an essential part of University education.

"We are of opinion that no valid objection can be maintained against the system of co-education for men and women medical students; and that this is the only system by which the general policy of the University can be effectively carried out. In our opinion adequate facilities for the medical education of women would not be provided in any hospital or medical school unless resident medical and surgical appointments were open to men and women on equal terms."

The report was forwarded by the Academic Council to the Senate, who resolved to communicate it to the schools in the Faculty of Medicine and to inform them that the Senate would be prepared to arrange for a conference and authorised the Academic Council to hold such a conference.

A conference was held on Jan. 30th, 1917, under the presidency of the then Vice-Chancellor (Sir Alfred Pearce Gould). The proceedings are set out in Appendix Ac. A. to the Senate Minutes of July, 1917. There was considerable divergence of view among the representatives attending. The Senate, after receiving the report, resolved that for the present no further action be taken in the matter. Owing to the action of the various medical schools in admitting women (see above) the question had solved itself, at least for the time being.

Again in 1921, on being notified of the decision of the London Hospital Medical College (see above) the Academic Council appointed a subcommittee to consider the question of the adequacy of clinical facilities for women. The report of that subcommittee, which was adopted by the Academic Council, is set out in S.M. 1339 of January 1923. They were of opinion that at that time there was no lack of clinical facilities and that it was not advisable to take any further action.

The Problem.

The problem before us has two aspects—that of providing clinical facilities adequate for the number of women requiring them, and that of providing such facilities in schools open to both sexes.

In its first aspect the problem is a comparatively simple one. The great increase during the war in the number of women taking up medical studies has been followed since the war by a striking decrease.

If we look at Part II. of the Second Medical Examination (see Table III.) as marking the passage from pre-clinical to clinical studies, we see in 1918 the number of women in London substantially exceeding that of the men; in 1919 the numbers are practically equal; from 1920, while men have maintained or increased their numbers, the women have fallen to less than one-half. In the London School of Medicine for Women the total number of students from 193 just before the war rose to 459 in 1920–21 and fell to 298 in 1926–27. Outside London the fall of women medical students, as appears from Table IV., has been even more marked.

TABLE I.

The following information, kindly supplied by the Registrar of the General Medical Council, shows the number of men and women whose names have been placed upon the Medical Register during the years mentioned :—

—	Men.	Women.	Total.	—	Men.	Women.	Total.
1922 ..	1657	475	2132	1925..	2245	490	2735
1923 ..	1999	514	2513	1926..	1797	376	2173
1924 ..	2341	474	2815	1927..	1649	319	1968

TABLE II.

The following figures (reports of University Grants Committee) show the numbers of full-time women students at the London School of Medicine for Women in the years mentioned :—

Year.	Medical	Dental	Total	Year.	Medical	Dental	Total
1920–21	447	12	459	1924–25	344	1	345
1921–22	433	11	444	1925–26	315	—	315
1922–23	409	10	419	1926–27	297	1	298
1923–24	374	2	376				

TABLE III.

This table, extracted from the University Calendar, shows the numbers of candidates at University examinations in medicine since 1916 (M., men; W., women) :—

Year.	First Medical.		Second Medical I.		Second Medical II.		M.B., B.S.	
	M.	W.	M.	W.	M.	W.	M.	W.
1916 ..	190	157	125	88	146	57	42	22
1917 ..	181	213	113	148	109	77	54	27
1918 ..	252	244	150	182	117	159	79	47
1919 ..	477	236	256	222	201	200	140	40
1920 ..	628	251	444	197	301	237	242	45
1921 ..	441	230	355	168	383	157	186	114
1922 ..	460	188	290	170	471	192	190	124
1923 ..	427	103	325	149	325	180	199	182
1924 ..	359	80	343	91	318	162	303	196
1925 ..	420	84	303	67	313	110	370	227
1926 ..	378	71	292	76	306	87	382	225
1927 ..	391	73	310	62	328	103	270	150

It would, however, be unwise to assume that the figures of women entrants will remain at their present low level. There appear to be already indications of a revival, and, though the policy of exclusion may for a time result in a number of women seeking admission to medical schools in the provinces and elsewhere, they will not, and in our view they should not, consent to being excluded from participation in medical education in the Metropolis. Taking all things into consideration, we are of opinion that the provision of 100 clinical places for women, apart from those

available at the London School of Medicine for Women, would be ample for the next few years. The London School of Medicine could during the war take more students than it has at present, and we understand that for the next year or two it could admit 15 more clinical students each year.

TABLE IV.

The following figures (reports of University Grants Committee) show the number of full-time students in (*a*) Great Britain, (*b*) London institutions, in the Faculty of Medicine in the years mentioned :—

Year.	Great Britain.		London.*	
	Men.	Women.	Men.	Women.
1920–21	8896†	2741†	2621	1040
1921–22	9017†	2595†	2873	1070
1922–23	9498	2368	3026	1049
1923–24	8866‡	1998‡	3048‡	936‡
1924–25	7896‡	1631‡	2894‡	823‡
1925–26	7288	1402	2840	775
1926–27	7179	1236	2713	683

* Excluding Guy's Hospital Medical School.
† Excluding universities of Oxford and Cambridge.
‡ Excluding St. George's and Westminster Hospital Medical Schools.

The numerical side of the problem, however, is the least important one. The real issue is as to the maintenance in London on a substantial scale of facilities for medical co-education at the clinical stage. This is a question of broad principle which different persons will approach with different prepossessions.

In all its other large faculties—e.g., in Arts, Science, Economics, Laws—the University of London is predominantly co-educational; actually, though it has a few Colleges confined to women, it has none in these faculties confined to men. The prepossession of the University of London has on more than one occasion been expressed to be in favour of a measure of co-education also in the great Faculty of Medicine. Is there any feature peculiar to medical studies making co-education, which predominates in the rest of the University, undesirable in that one field ?

CO-EDUCATION IN MEDICINE.

We can say at once that we are satisfied that the relationship existing between men and women students of medicine is not of itself an objection to co-education, and we are glad to say that none of the representatives of schools who had had actual experience of women students alleged any case of difficulty or the need of disciplinary action arising out of this relation; uniformly the conduct of the women was described as excellent. In this respect our own conclusions agree with those arrived at by the inspector appointed by the Senate, the late Dr. J. George Adami, in his report on the medical schools (S.M. 2435 of March 26th, 1924). The report stated :—

"The reports of the Deans of the co-education schools regarding the work and attitude of the women students were uniformly favourable. The Dean of one school bore evidence to the improved tone of the men students since women were admitted. The Deans of two schools gave it as their impression that as the result of co-education the women students of their schools were more womanly and more considerate in their dealings with hospital patients than women trained apart from men."

Other objections have been urged: the necessity of providing special accommodation (residential and other) for a mixed staff; the difficulties of teaching mixed classes in some subjects; the tendency of women to crowd to the front at demonstrations; and the difficulty in the way of reproving a person of one sex in the presence of persons of the opposite sex. We think there may be some force in these objections, but here also they have not been felt to be insuperable by schools with actual experience of co-education, and in fact they appear to us capable of adjustment with no more difficulty than most co-educational problems.

Nor are we impressed by the argument that the medical education of women is to a great extent thrown away by the "wastage" that occurs owing to marriage and other reasons which result in women leaving the medical profession after undergoing the expense and difficulty of qualification. As a matter of fact, it would appear from the information before us that the "wastage" is much less considerable than is sometimes supposed. In so far as it has any weight, the argument tells not against co-education in medicine, but against any medical education of women at all. In London it certainly cannot be used as an argument for curtailing the facilities for women, for, in the aggregate, the number of places vacant is certainly greater than the number of applicants who could fill them. On the other hand, we think it is clear that in medicine women certainly gain by being educated side by side with men, and that such an education is a very valuable training for that coöperation which in their subsequent careers becomes necessary between medical men and women. It may be that the advantage is not felt so much by men students, and indeed co-education for some men may not be profitable. On the balance, however, we think that the advantage to the women outweighs any possible loss to the men.

We do not suggest, however, that there are no difficulties in the way of medical co-education in London. They are not the difficulties we have already referred to. The real difficulties arise from (*a*) the multiplicity of medical schools and their competition for students, and (*b*) the feeling against co-education entertained by some of the men already in the medical profession, some of the men students, and a section of the public. With few exceptions the authorities of the medical schools appear to be convinced that men, if they have a choice, prefer to go to schools which do not admit women, and that the feeling is strongest among the men, and in some cases the parents of the men, who on general grounds would be most desirable. Since there are now certainly not enough students to fill all the schools, this means if some schools admit while others exclude women, that co-education is in unstable equilibrium; and that the school which admits any women will have a disappearing number of men. This feeling of antipathy may be deplored, but we have no doubt as to its existence, and since the medical schools are dependent to a very considerable extent on the income derived from students' fees, it is only natural that the authorities of the schools should be concerned with the economic problem to which it gives rise. In one of the cases at least in which a genuine attempt was made to provide absolutely fair treatment to women students, it was only the apprehension that the policy of co-education was heading the school for disaster which led to its reversal. How the exclusion of women can in all cases increase the number of men entrants all round is not obvious, for the number of possible entrants is not unlimited; that, however, is a matter on which we need not express an opinion. How long this feeling is likely to endure, and, in particular, whether it would endure indefinitely against the attraction of first-rate teaching and equipment in a co-educational school, are questions which it is difficult to answer.

Conclusions.

We are unable to see any valid argument on the merits against the provision of co-education in medicine. The prepossession of the University is in favour of such co-education. The changed public position of women and the general development of the relations between men and women in the past generation are too obvious to need comment. If the field were clear we find it hard to believe that anyone who at the present day was planning fresh medical education in London as a whole would plan it otherwise than on the basis of being, like education in the other faculties, predominantly co-educational. In medicine, as in other fields of study, the services of the schools of the highest prestige and the teachers

of the highest distinction should be available to men and women indifferently, and men and women, who after their University careers have to work together in so many new relations, should learn to do so at the University stage.

We do not, indeed, wish to suggest that co-education should be universal in the medical schools. Among the consequences which might result from the adoption of such a policy would be that in some schools there would be only a very small number of women—perhaps only one woman. Such a condition of affairs would on various grounds be highly undesirable. There should in our view be three types of clinical education: (1) for men only, (2) for women only, and (3) for men and women. This involves the maintenance as men's schools of certain existing schools, the maintenance of at least one women's school, such as the London School of Medicine, and the provision of facilities for co-education.

The field, however, is not clear. The existing medical schools, though schools of the University, came into existence before the reconstitution of the University, and some of them are of great age with long traditions to which they are naturally strongly attached. Speaking generally, they originated in the hospitals of which they form part, and even now they have not as a rule a separate legal existence,* and their students in the course of their training fill posts in the hospital. They are thus even more independent of the University than are other schools, all of which are autonomous and responsible for their own finances. Further, a large proportion of the students, amounting in some of the medical schools to over 50 per cent., are working for examinations other than those of the University—e.g., for degrees of Oxford and Cambridge or for the diplomas of the Conjoint Board.

The University at present has only one means of enforcing policy upon a medical (or any other) school; it can, subject to appeal to the Visitor, i.e., the King in Council, withdraw recognition of the school and so make it practically impossible for the students to prepare for internal degrees of the University. This power is clearly useless in the present issue. The University cannot make admission of both sexes a condition of recognition for any medical school unless it is prepared to do the same for all medical schools—i.e., to force women upon the schools which have never had them and men upon the London School of Medicine for Women. Logically, moreover, it would be compelled to apply the same principle to other faculties, and force men upon Bedford, Holloway, and Westfield Colleges, all of which are women's colleges, and women on the theological schools, which are colleges for men. It has been said that the University has statutory powers and duties which compel it to provide facilities for co-education, but this is not the case. It is, of course, true that as long ago as 1878 the University obtained a Charter providing that all its powers relating to degrees should apply to women as well as men, and Statute 22 (*e*) prescribes that in making any Statutes, by-laws, regulations, or standing orders, the University shall not impose any disability on the ground of sex. This is, however, only a limitation on the powers of the University; it does not mean and could not without revolutionary change be interpreted to mean that every school of the University must admit both sexes, and still less that it is under an obligation to make provision for all women students who may present themselves. The new Statutes make no change in this respect.

When the new Statutes come into force the position of the University will be different in one respect—namely, that the Treasury grant which is at present paid direct to the medical schools (see Table V.) will in future be paid in a lump sum to the University. For the reasons already given we do not think that power over grants could be used to compel a medical school to remain or become co-educational against its will. The arguments against withdrawal of recognition as a means of enforcing co-education apply with almost equal strength against withdrawal of grants. On the other hand, the control of substantial sums will put the new Court and Senate of the University in a better position to secure by agreement with one or more of the existing medical schools, or with a new school, that adequate provision is made for the medical education of women both co-educationally and otherwise.

* St. Bartholomew's Medical College is an exception. This is a separate corporation, established by Royal Charter. One of the clauses of the Charter restricts admission to men students.

TABLE V.

The following figures (report of University Grants Committee) show the amounts received by the medical schools from the Treasury during the year 1926–27:—

PARLIAMENTARY GRANTS.*

School.	Full-time students.			Grants for 1926–27.
	Men.	Women.	Total.	
Charing Cross	38	45	83	£2,100
King's College Hospital ..	140	67	207	2,950
London	337	9	386	13,950
London School of Medicine for Women	—	298	298	11,750
Middlesex	196	—	196	5,900
St. Bartholomew's ..	592	—	592	16,400
St. George's	82	—	82	950
St. Mary's	171	57	228	10,760
St. Thomas's	367	—	367	13,130
University College Hospital	197	59	256	15,500
Westminster	40	30	70	550

* *Note*—Guy's Hospital Medical School is not in receipt of Parliamentary grant.

Co-education, if it is to succeed, must be voluntary. Before the war the tradition or policy of the medical schools was opposed to co-education, and its introduction during the war was due to the initiative of the schools, though it was welcomed by the University as being in accordance with its own policy. Its restoration can, we are convinced, only come about by an agreement between the University and the schools and possibly by an arrangement by which the several schools would agree to a certain quota of women students.

RECOMMENDATIONS.

It is recommended: 1. That the foregoing report be generally approved and that copies be forwarded to the schools in the Faculty of Medicine and to such other bodies and persons as the Vice-Chancellor may direct.

2. That, in communicating the foregoing report to the schools in the Faculty of Medicine other than University College Hospital Medical School and the London School of Medicine for Women, the Vice-Chancellor be requested to invite them to consider the possibility of admitting a quota of women students as a means of giving effect to the policy of the University as set out in the report, and that no communication of any kind be made to the press except on the authority of the Vice-Chancellor.

The report is signed by Sir William Beveridge, the chairman.

MEDICINE AND THE LAW.

Inquest on Christian Scientist.

AT an inquest recently noted in this column the parents of a young man, for whom medical aid had not been provided, were warned by the coroner that, if their son had been 15 years of age, they would have been liable to indictment for manslaughter notwithstanding their bona fide belief in Christian Science. This belief, and the consequent refusal of medical aid, came again into prominence at an inquest at Oxford on Jan. 23rd. The deceased was a widow who had for many years been a Christian Scientist. Her son-in-law gave evidence that she entered Coston Hall, a Christian Scientist nursing home, last October.

He could find out nothing about her health because her attitude was that there was nothing wrong with her and that she would have no medical aid. He asked the superintendent of the home for a medical report, but received the reply that in such a home there could be no medical examination and no medical report. He afterwards took her from the home and obtained the services of a medical practitioner for her, though she was evidently reluctant to avail herself of them. The practitioner, Dr. J. F. West, in issuing the death certificate, gave as the causes of death dysentery, extreme wasting, and Christian Science. He explained that he added these last words in order to ensure a coroner's examination of the case. His evidence was that her condition was definitely aggravated by the neglect to provide medical aid. Here it may be borne in mind that one of the cases which a registrar must report to a coroner before registration of a death is "any death which the registrar has reason to believe to have been unnatural or directly or indirectly caused by any sort of . . . neglect." It is clearly the duty, therefore, of the certifying doctor to show upon his certificate in some form the fact of neglect which in certain circumstances is a criminal matter.

As stated in the previous case, the legal rule is that it is manslaughter to cause death by neglect to supply necessary food, care, and medicine to children, prisoners, or helpless persons where a legal duty towards them exists by statute or contract. The case of children is clear; the case of prisoners was illustrated when a former Home Secretary defended himself in argument against criticisms of his having ordered the forcible feeding of hunger-strikers. The case of helpless persons is perhaps more obscure. In the Chattaway case in 1922 a man and his wife were charged with manslaughter of their daughter, aged 25, who had returned to her parents' home ill and weak. They allowed her to stay but neglected her, and she became too ill to leave them or to get help. They were sentenced to five years' penal servitude, and the Court of Criminal Appeal said the daughter was as helpless as an infant; the question of helplessness, added the judges, was one for the jury; there was a common law duty to take proper care of an adult who was helpless and could not withdraw from the control of persons having charge of him or her. In R. *v.* Shepperd, an older case, a mother deliberately neglected to procure proper attendance for her unmarried daughter, aged 18, in the latter's confinement, this neglect causing death in childbirth. It was held that, although the daughter was living with her mother at the time, and though the mother could have got medical aid gratis, there was no such breach of duty as would render the mother liable to conviction for manslaughter. In the recent case at Oxford it might be supposed that insurance companies would be inclined to regard the death as one of suicide, and in popular language the management of the home might be spoken of as having aided and abetted self-destruction. There is, however, no element of criminality in the keeping of a "Christian Science house"; indeed, such institutions obtained a form of recognition from Parliament when they were expressly exempted from the Nursing Homes Registration Act of 1927. The relation between the superintendent of the house and the voluntary inmate is contractual not statutory. And the contract presumably is not for the provision of such food, care, and treatment as a medical practitioner would reasonably recommend when a patient is in ill-health, but for something conspicuously different.

Two anonymous donors have given £5000 to Edinburgh Royal Infirmary in memory of Dr. A. B. Smith and Dr. S. McK. Smith. It is to be used in connexion with the proposed Radium Institute. Sir Stanford London, president and chairman of St. Paul's Hospital, Endell-street, London, has given £1000 to this hospital to start a memorial fund to the two brothers, who died immediately after their association with its work had been arranged.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Local Government Bill: Maternity and Child Welfare.

THE House of Commons went into Committee on Wednesday, Jan. 23rd, on the Local Government Bill, Mr. J. F. HOPE (Chairman of Committees) in the chair.

Discontinuance of Grants.

On Clause 68 Mr. GATES moved an amendment to exclude the maternity and child welfare services from being discontinued grants, and to keep them, as at present, on the percentage system, instead of bringing them under the block system. There were, he said, very good reasons why this should be reconsidered by the Ministry of Health. The actual cost of the maternity and child welfare grant last year was only £1,052,000. The service was a young and growing one, and of great importance. The antenatal work was only just beginning to be considered under the maternity schemes, and maternal mortality had hardly been considered at all under these schemes. The expenditure was growing, having increased 36 per cent. in the last five years. The medical officer of the Ministry of Health (Sir George Newman), in his latest report, stated that 25 per cent. of the young children entering the elementary schools to-day were suffering from some physical defect which could have been prevented had they had better treatment before entering school. Hitherto 50 per cent. of the expenditure had been borne by the Ministry itself, but under this Bill a block grant would be made to the appropriate authority which would itself decide how much of the money should be spent in maternity and child welfare work, and the question naturally arose whether these services would receive an adequate proportion of the block grant to allow for the much-needed expansion of the work, and how far there was security under the Bill against local factors operating to restrict expenditure and thus hinder its progress. The block grant was originally fixed for a term of five years, but he was glad that the Minister was proposing to alter that and make the first period three years, the second four years, and the subsequent periods five years. Those who were interested in maternity and child welfare regarded this as a great improvement, because many things might happen in five years. But even three years was a considerable time, and if during that time it was necessary to expand these services, the cost would have to be defrayed out of the rates. That would be a serious disadvantage to the successful prosecution of the maternity and child welfare services. It had been said that at present a richer borough spent more because of the percentage grant, and the necessitous borough spent less. He was not prepared to admit that that was true, but if it were true now, it could not be true after this Bill came into operation, because there would be the large sum of £45,000,000 to be distributed among the boroughs according to their necessity. It had also been suggested that the percentage system implied a considerable amount of official interference with the local authorities. He had been interested in local government for many years, and he had never heard anything but praise of the official interference of the officers of the Ministry of Health in connexion with work such as maternity and child welfare. Another point was the work done by voluntary associations. Those associations considered themselves very much discouraged by this Bill. He hoped that the Minister would be able to give them some comfort in regard to the future. Some of them had received grants from their local councils, but not all, and in every case they had received from the Ministry 50 per cent. of their approved expenditure on maternity and child welfare work. That, of course, passed away under this Bill. He did not think that the Minister had enough power to see that these associations were recognised by the local authorities to whom in future they would have to look for assistance in their work. Those who were associated with him in moving this amendment were not in the least degree inspired by hostility to the Minister of Health, to his Department, or to the Bill. There was much in the Bill which they all liked. But he would point out that there were many services which would still continue to be run on the percentage grant system. Resolutions in support of the amendment had been sent to him from all sorts of societies, including the National Council of Women, the Society of Infant Welfare, and the Ragged School Mission. It was also supported by the Society for the Care of the Unmarried Mother and her Child, of which Mr. Chamberlain was the President.

Development of Welfare Service.

Mr. A. GREENWOOD said that the Labour Party were fully in agreement with the amendment. Every social

service to-day was undergoing development, and that was particularly true of maternity and child welfare. There was not a single health service, however, which had been utilised to the extent that Parliament permitted, and any step which under these circumstances would tend to hinder even one local authority from continuing to develop its work must be disastrous to the social services of the country. On April 1st of last year there were 847 antenatal clinics struggling with a mass of work with which they could not possibly cope effectively. As a matter of fact there was room for 1847 such clinics, or even more than that. The financial clauses of this Bill, which constituted the real partnership between the State and the local authorities, were delivering a felon's blow against that particular service, which was not even extracting 10 per cent. of its possibilities. He did not pretend that the percentage grant system was in itself an ideal one. But the system was condemned by the Treasury not because it was not assisting social services —indeed it was doing it too well—but because it meant the expenditure of State money. Every new development of maternity and child welfare work after the grant had been fixed would be entirely a local burden, and under such circumstances did the Minister suppose that hard-pressed local authorities would undertake the developments which many of them desired?

The Countess of IVEAGH said that there was a great deal of diversity of opinion on this subject among women who were interested in these particular services. She admitted, however, that there had been apprehension as regarded the possible operation of the block grant versus the percentage grant, and that seemed to be chiefly based on the assumption that it was easier to induce a local authority to develop a health service if they could offer that authority something in the nature of a good bargain. Of course, that only applied to the areas which could afford to take advantage of the bargain offered, and it could not be denied that it was the richer areas which had benefited most under percentage grants. If the arguments for this amendment were sound, she could not see why they should not apply to all the health services, and not merely to maternity and child welfare. But the exempting of all health services would, of course, whittle away the whole basis of the Bill, and leave the present inequality between the richer and poorer areas. Under the Bill a much larger sum of money would be at the disposal of the poorer areas, and under another clause the Minister would be in a position to say to a local authority, "You have now more money, and it is up to you to provide a reasonable standard of efficiency in discharging these functions." She urged hon. Members to trust the Minister to put Clause 86 into operation in such a way that they need have no fear of the development of those services which many of them had so much at heart.

Mr. HARRIS said since child welfare had been started the death-rate per 1000 had gone down from 105 to 7. There was still a tremendous amount of work to be done. A number of boroughs in London were very much behind, and there were whole districts which were not adequately catered for. If there was anything for which an exception should be made, surely it was this new pioneer work of looking after the mother at a critical time in her life.

Objections to Percentage Grant.

Dr. VERNON DAVIES said that he was sure that Members on both sides of the House were anxious that nothing should be done to interfere with the development of this service. He was definitely opposed to the percentage grant for this service and in favour of the block grant. Under the percentage system the money was not given according to need, but simply according to ability to pay. Moreover, percentage grants tended to encourage extravagance among local authorities. One could always be extravagant with a service when one had only to pay half the cost. There was also the other very grave objection that a percentage grant necessitated very careful Government control of expenditure. Percentage grants were given in the first place as a stimulus for the development of a service. The essential nature of the stimulant was that it was temporary; if they made it permanent it tended to become a narcotic, and there was a danger of this happening with maternity and child welfare. The percentage system had been in existence for some time, and all local authorities had had the opportunity of taking advantage of it, yet a very large number had not yet done so. In certain cases, owing to lack of interest in the service, they had not troubled even to start it. In other cases, in wealthy districts, there had perhaps been the fear of an increase in the rates which had prevented them from taking the service up. But the main cause, he thought, had been the poverty of different districts. They could not afford to pay their 50 per cent. quota, and it was on behalf of the poorer authorities that he thought they should welcome the action of the Minister in bringing in the block grant. He had noticed more than once that there was a tendency in the House and in the country to value the success or otherwise of a service by the amount of money spent upon it, and to say that if the expenditure increased by 10, 15 or 20 per cent., the service of necessity was improved. But increased expenditure did not necessarily mean increased efficiency, and the point which they had to consider, particularly in regard to the block grant system, was, would the money be sufficient for the service, and they had the assurance of the Minister of Health on the second reading of the Bill that that was the case. No one could legitimately say that these services were going to be starved for want of money. The money would be there under the block grant if the public cared to have it. By Clause 86 the Minister was given such power that he could either initiate or see that these services were carried on in an efficient manner. He (Dr. Davies) thought that public opinion, knowing of the new money that would come into the district by means of the block grant, would begin to insist upon local authorities using it for this specific purpose, and that would have a very marked effect. He had initiated and carried on such a service, and it was as a result of his experience that he was convinced that the day of the percentage grant for maternity and child welfare was over. The personnel in welfare service was very much more important than money. As far as he could see, the result of block grants would be, first of all, an increased number of centres, particularly in necessitous areas which up to the present had not been able to afford them. They would also find that there would be an efficient standard in all the centres.

Funds for Health Services.

Miss LAWRENCE said that Lady Iveagh had said that poorer authorities would have plenty of money to spend, and that the Minister would have power to enforce health services. Both these remarks were entirely and completely mistaken. What guarantee was there that local authorities were to get anything extra? They were to have a minimum of a shilling per head of the population over what they had lost on the standard year 1928–29. What was a shilling per head of the population? They had no detailed figures, except in regard to the county boroughs. The amounts they actually got in rate relief were in some cases 1*d.* and in some 1½*d.* The best was 2½*d.* The formula did not in the least correspond with the distinction between rich and poor. The incidence was so capricious that some rich places might gain a great deal and some poor places, under the unrestricted operation of the formula, might lose a great deal. But even supposing that for the first three years the poorer districts got a penny or twopence off the rates, that was not very much. This had to account for all the losses with regard to the possible rise in rateable value of properties, and to account for all the new road work, maternity work, tuberculosis work, venereal disease work, and the rest. That little extra would leave some of the districts worse off if they did anything at all commensurable with regard to their health services. Lady Iveagh seemed to be under the impression that Clause 86 gave the Minister power to insist upon the maternity work being undertaken. It did not do so. No clause asking for a reasonable standard could turn optional services into compulsory services. No words said with regard to the maintenance of a reasonable standard of health could undo the express action of Parliament, which had made venereal disease, maternity benefit, and tuberculosis optional services. This was a very badly drafted clause. Sir George Newman in his report for 1927 said:—

"There can be no doubt that the percentage Exchequer grants-in-aid on health services (Tuberculosis, Maternity and Child Welfare, Welfare of the Blind, Venereal diseases, Mental Deficiency, and the School Medical Services), have been of the highest possible value and incentive during the last 15 years, (*a*) in getting special medical services into operation, and (*b*) in guiding their direction. Those two advantages would not necessarily be lost by a system of quinquennial block grants, though some definite adjustments of administration will be necessary to secure them."

A block grant was quite a different thing from a fixed grant. A block grant every five years on a programme might be a very good thing indeed. In their evidence before the Royal Commission on Local Government the Ministry of Health said:—

"As is to be expected from the permissive character of the Maternity and Child Welfare Act . . . the schemes at present being administered differ widely as regards their efficiency and completeness. It has been the policy of the Minister and his predecessors to stimulate local authorities to initiate schemes, and so on."

There was no power to compel these authorities or to force what was an optional service on them. The position of the health grants to voluntary societies was also extraordinarily unfortunate. Some local authorities had already expressed the opinion that it was unfair to give grants which really belonged strictly to their own residents to a national society. That feeling, unreasonable as it might be, was very strong. Lady Iveagh seemed to think that it was a reductio ad absurdum to say that they must care for the sufferers from

tuberculosis, care for the blind, treat venereal disease, and take over the care of mental deficients. The Labour Party stood for the logical extension of the principle. Those interested in the question of mental deficiency had pointed out that the grants for that purpose were similar to those for maternity and child welfare. They had pointed out the deplorable state of the child mental deficients and the adult mental deficients who were not looked after. Take the case of venereal disease. So reluctant were local authorities to take up the question that a grant of 50 per cent. was not enough; 75 per cent. had to be given. Did the Committee think that local authorities who had been bribed by such an enormous percentage to undertake this work were going to carry it on when they had to take every additional penny they spent on it out of the block grants handed over for other purposes? What were powers of compulsion, even if the Minister had such powers? Unless the authorities were really willing they could not get them to do the work. It was desired by every local authority that the percentage grants should continue.

Sir D. NEWTON said that that morning, at a meeting of the County Councils' Association, reference was made to this question, and the Association were unanimously of the opinion that mental deficiency and maternity and child welfare should not be excluded from the block grant system. He did not believe that this change would be to the detriment of the maternity and child welfare service; on the contrary, he believed that the proposal would tend to stimulate the interest of local authorities in the service. It would be better, too, for many of the voluntary associations concerned. At present in many cases voluntary associations interested in maternity homes had to make application to numerous different boards of guardians for assistance, but in future such associations would be able to apply to the major authorities, who were more readily approached and would be more likely to be sympathetic.

Miss WILKINSON said that the Minister of Health had provided under the Bill that the extension of the road services must be left on the percentage basis. If that was necessary for that service it was infinitely more so in the case of a service which concerned the lives and welfare of children. She desired that the mothers and children of the slums should have the best that medical science and service could offer. Maternity and child welfare was a new service which was not organised. It depended on groups of women and medical men who realised its importance, and she appealed to Mr. Chamberlain to remove the service from the block grant system.

Viscountess ASTOR said what she was anxious about was the extension of health services under the block grant. Those services had not grown because of popular demand; indeed they had grown in spite of general apathy, because they had been inspired by the central authority working mainly through voluntary associations and local authorities. The lead had generally come from the central authority, and she felt that the service was now going to be left entirely to the local authorities. Very seldom did local authorities move unless they were prodded by the Ministry of Health. What was the Minister going to do about new services under the block grant system? They found it difficult enough to get expansion under the percentage system, and they did not want to make things more difficult. There was the tremendous problem of children between 1 and 4 years of age. Last year 82,000 children under 14 years of age died, and 23,000 died between the age of 1 and 4.

The Minister's Reply.

Mr. CHAMBERLAIN, Minister of Health, said that he did not think that there was any difference of opinion between Members on opposite sides of the House as to the value and importance of the maternity and child welfare services, the results of which had been so remarkable, and of which every one of them felt proud. It was inconceivable, however, that the Treasury should, as had been suggested, seek to impose a change of policy on the Ministry of Health in respect of a service on which it could only gain a few hundred thousand pounds. Do not let them be too abstract and theoretical about these matters. They might very well find that one system of grants was best for one kind of service, and another system for another service. He judged the question of block grants or percentage grants on their merits as applied to particular services. In his view, it was in the best interests of the maternity and child welfare service that they should change the present system. He assured the Committee that at the Ministry of Health, where he was not looking at one particular locality but where he had to consider the reports coming in from all localities, he did not find the present system satisfactory. He did not find that where the local authorities were indifferent or niggardly the offer of pound for pound was sufficient to make them "willing" to take up a service. That was just the trouble. On the contrary, many authorities remained unwilling, and in those circumstances he had no power to compel them. That was the key and kernel of the whole situation, and provided the reason why it was impossible to get along faster under the present system. He would quote one or two figures to show how the present system worked. They were figures of the grants per child under 5 years for the year 1926–27. They affected four towns: Gateshead, 27*d.* per child; Dudley, 21*d.*; Tynemouth, 36*d.*; Merthyr Tydvil, 43*d.* No one would say that these towns were not poor or that they were not just those towns where there ought to be very good services. Here were others: Manchester, 128*d.* per child; Liverpool, 107*d.*; Leeds, 140*d.*; Eastbourne, 200*d.* How could they defend distribution of that kind? Was it likely to encourage the institution of adequate maternity and child welfare services in those poor districts? The amount of money required per head to give an adequate maternity and child welfare service was very little, and trifling compared with such things as education and roads. In the vast majority of cases there would be no guarantee of a shilling per head because the gain under the scheme was going to be much more. But the shilling per head would be a guarantee to the few places which were not going to gain a great deal more. In future, therefore, it would not be possible for a local authority to say that they could not afford to have a proper maternity and child welfare service, because they were going to have sufficient money under the scheme to enable them to give sufficient services.

Miss LAWRENCE: How much of this money is going to these services?

Mr. CHAMBERLAIN said that would be for the local authority to determine. But having provided them with sufficient funds he would be able to say to a backward authority that it must bring its service up to the proper standard. It was true that he could not force local authorities to give adequate maternity and child welfare services, but if he had a lever before in being able to offer them something on condition that they spent a little themselves, he would have a much more powerful lever under this Bill, for he could take away from them that which they had got, and there was no limit to the amount of their grant which he could take from them. But he did not think it would be necessary to go to extremities, because no local authority would resist a reasonable demand for adequate services of this character, and no local authority would risk the loss of a grant which would in future form a large part of its whole income. He thought that some of the bodies which had passed resolutions on this subject had been a little hasty and had done so without hearing both sides. Some of them, when they understood better what it was proposed to do, had changed their minds. He wished to say that he attached great importance to the work that was done in this connexion by the voluntary associations. He had the greatest admiration for their work. He had always been in favour of the associations between voluntary workers and municipal workers in social matters. Anything that would destroy a partnership of that kind would be unfortunate and wrong, and he was therefore very anxious that the voluntary associations should be assured that their interests had been properly looked after in this Bill. The Minister under Clause 83 was brought in to protect their interests. These associations must not suppose that the guiding hand of the Ministry was being withdrawn. The inspections of this work by officers of the Ministry of Health would continue though in a different form, as in the past. The Minister would be kept in close touch with the work which these associations were doing, and although in the future they would get their grants from the local authority, the Minister, whose approval of the scheme had to be obtained, would be able to see that their interests were properly looked after. He proposed to add a new clause to the Bill under which it would be possible for a voluntary association who desired to extend its services to make a representation to the Minister, who would have power, after consultation with the local authority, to call for the scheme which had already been approved and to alter it as he thought fit. That ought to meet the point which had been made that whilst schemes that were approved at the beginning of a fixed period might be adequate in themselves and for that time, yet there was not sufficient room for expansion under the Bill as it stood. With regard to new services, if Parliament should impose on local authorities a new service which meant new expenditure, clearly it would be only just that Parliament should make some provision for an additional contribution from the Exchequer towards the cost of that service. He had now put down a clause which made this quite clear. In conclusion, the right hon. gentleman asked the Committee to consider whether the present situation of the health services under the percentage system was so satisfactory that they could be content to go on in the future as they had been doing in the past. After all, the whole of the changes which would be produced by this Bill would have to be reviewed before many years were over, and there would be an opportunity then to compare the working

of the old system with that of the new, and in those circumstances surely it was wise to accept the provision in the Bill as it stood.

After further debate

A Great Advance.

Lieut.-Colonel FREMANTLE said he hoped that he might be allowed to make a few remarks as an old medical officer of health who had been in close touch with these voluntary associations, and in active coöperation with them for 30 years. When the first general lines of the Bill were announced he shared the very great anxiety which had been expressed at the abolition of the percentage grant. He would say no more at present than that under certain conditions he was convinced that the Bill as a whole was a very great advance, and they had to make the most of it. But there were two points which had not been mentioned. Members of the Opposition who had spoken with such warmth on the subject of ideals which were common to them all seemed to have left out of account the question of the distribution of the grant which was the alternative to the percentage grant which they were advocating. When they were contrasting the percentage grant and the block grant it was essential to bear in mind that the Bill introduced into what had been roughly called the block grant the new principle of weighted population. Medical officers of health looking at the thing from the point of view of the health of the people must recognise that an extraordinarily interesting new factor was introduced into the world of administrative public health. This weighting of the population according to the number of children under five years old, and the number of unemployed, had very great possibilities. It was obvious that there would be a great deal more money in the new Bill, and it was germane to consider how it was going to be distributed in future. This Bill would be extraordinarily helpful in dealing with really indigent people. Obviously a great deal depended upon how the local authorities were going to use the powers given to them under this Bill. If they looked honestly at the measure as a whole there was a great opportunity for getting greater interest and responsibility, and for focusing attention on local government on business lines. He did not believe that there was going to be a revolution, but it would give a very large measure of support in that direction, and, coupled with the enormous extension of the franchise, it would give an opportunity to press upon the electors the responsibility which was thrown upon them, and with an increased public interest in local government they would be able to trust the local authorities to carry out the block grant system properly and with very great advantage compared with the present system. In that sense he looked forward to the Bill being the magna charta of local government.

After further debate the amendment was rejected by 206 votes to 130.

The clause was added to the Bill by 200 votes to 120.

General Exchequer Contributions.

On Clause 69 Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) moved an amendment to give effect to the new proposals which had been made by the Government after consultation with the local authorities providing that the first two periods for which a general Exchequer contribution would be fixed would be three and four years instead of five years as originally proposed. These two periods would be followed by two periods of five years. The result of this amendment would be that the total period for transition to the full working of the formula would be extended from 15 to 17 years. Thereafter the grant periods would be quinquennial periods, and it was proposed that after 1931 the census should be taken at quinquennial intervals, so that the distribution of the grant would be based on census figures instead of estimates. The next census would be taken in 1931.

Miss LAWRENCE moved to reduce the first period from three years to two years.

Miss LAWRENCE's amendment was rejected by 177 votes to 112, and Sir K. WOOD'S amendment was agreed to without a division.

The House of Commons on Monday, Jan. 28th, continued its consideration of the Local Government Bill in Committee.

On Clause 83, which deals with

Contributions by Councils to Voluntary Associations

in respect of maternity and child welfare, Sir LESLIE SCOTT moved an amendment to impose a statutory obligation on county and county borough councils to consult with voluntary associations doing maternity and child welfare work before framing their schemes.—Mr. CHAMBERLAIN, in reply, said that the amendment was quite unnecessary, because it was impossible—and that must be evident—for any council to frame a scheme of that kind without consulting the voluntary association. The clause provided that the county councils or county borough councils should prepare schemes for securing payments by them of annual contributions towards the expenses of voluntary associations. In order to know what these expenses were, the councils must know what the associations were doing, were able to do, and proposed to do in future. The Minister of Health also had to approve of the schemes, and if the schemes were submitted without consultation with the voluntary associations, it would be open to the associations to represent to the Minister that they had not been consulted.—The amendment was withdrawn.

Mr. HURST moved an amendment giving power to the Minister of Health to include in the schemes prepared by county councils provisions whereby contributions towards the costs of inmates in a maternity home within their areas might be enforced against the council of any other county or borough where an inmate normally resided before entering the home. He said that the amendment would enable the unmarried mother to avoid local scandal by going into a home at a distance.—Mr. CHAMBERLAIN said it would be a mistake to make it more difficult for maternity homes to take in unmarried mothers from other localities. In the past, direct grants had been given from the Exchequer to the homes, but in future the grant would be given to the local authority in whose district the home was situated. The local authority would not have discretion to spend the money on anything else. For seven years it would receive 75 per cent. of the grant previously given, for the next five years 50 per cent., and for another five years 25 per cent. The amendment was rejected, and the clause was added to the Bill.

Clause 84 provides for contributions by councils to voluntary associations in respect of other health services. Sir L. SCOTT moved an amendment providing that the Minister should, before the beginning of each fixed grant period, make a scheme providing for the payment of contributions by councils of counties and county boroughs of such amounts, as might be specified in the scheme, to voluntary associations which undertook to provide, centrally or locally, services for the welfare of defectives, including the ascertainment, assistance, or supervision of mental defectives whilst not in institutions. He said that as the clause now stood some of them feared that it might have the effect of limiting the services for which the grants under the clause might be given. A great deal of the best work in connexion with mental defectives was done outside the local authorities, and he wished to make sure that there would be no limitation in future in grants for work done by way of assistance to the local authorities.—Sir T. INSKIP (Attorney-General) said he could give Sir L. SCOTT the assurance which he desired. The amendment was accordingly withdrawn.

Sir KINGSLEY WOOD moved an amendment giving power to the Minister of Health, after consultation with the local authority concerned, where it was desired to start or further a maternity or child welfare scheme, to alter the scheme so as to provide for such contributions or increased contributions as he considered just. He said that with this amendment and the original clause in the Bill the Government were giving a very strong position to the voluntary associations carrying out this work.—Dr. FREMANTLE said that his name and that of Major Hills were down to an amendment earlier on this clause, but he purposely did not move it because this amendment covered the same ground. He had tabled his amendment because the clause did not provide for the future expansion of this service. It was put down on behalf of the Midwives' Institute and the Queen Victoria Jubilee Institute for Nurses. Those professional bodies, which were largely neglected by public opinion, were at the bottom of the working of these maternity associations, and they would, he believed, be abundantly satisfied by this amendment. He hoped that there would be a possibility of covering now, for the first time, the whole of the counties with the work of the county nursing associations in nursing and midwifery.

Sir W. GREAVES-LORD moved an amendment providing that the Minister of Health should, before the beginning of each fixed grant period, make a scheme providing for the payment by county and county borough councils of such an amount as might be specified in the scheme to the central council of an approved organisation which provided services, in the nature of general publicity and educational propaganda, in furtherance of the prevention and treatment of venereal disease. He said that he could not understand why the Government had thought it necessary, in the Bill, to take a course which would destroy to a large extent the activity of one voluntary association—the British Social Hygiene Council—whose work had been recognised not only by the Government but by the Royal Commission on Venereal Disease, and which had been carried out to the expressed satisfaction of the Ministry of Health. Under the Bill, other health services, such as maternity and child welfare, the care of mental defectives and of the blind, would be materially affected if anything was done to diminish the efficiency of the measures taken for the prevention and

urative treatment of venereal disease. Most valuable work in regard to propaganda, advertising in the public press, and the exhibition of films had been carried on by the British Social Hygiene Council. They had undertaken work which no local authority could carry out. Within the last few weeks inquiry had been made from a number of medical officers of health, all of whom stated definitely that they considered that public enlightenment on venereal disease was essential. The amendment would enable the Ministry to make an equitable scheme, which would provide for a contribution based upon 5*s.* per 1000 of the population. If that were impossible, however, and the Minister could deal with the matter as he desired in Clause 86 of the Bill, he would be content.

Sir KINGSLEY WOOD resisted the amendment. He said that Sir W. Greaves-Lord was seeking—following, he supposed, the precedent already established in relation to the maternity and child welfare services—to secure that the local authorities should be obliged to pay an annual contribution to the British Social Hygiene Council, or some corresponding body. The Minister of Health shared with the mover of the amendment his appreciation of the work which that Council had achieved. Undoubtedly it had done very good service, especially in the earlier days when that kind of work was much more unpopular than at present. But, on the other hand, they must look at the position so far as the local authorities were concerned. Those authorities were to a very large extent actively engaged in the work of stamping out the disease. During the present year some £7500 had been spent by the local authorities. Many local authorities desired to include venereal disease as one of the subjects in their general scheme of health propaganda. There was a great distinction between the position of voluntary agencies which were carrying out maternity and child welfare work and pure propaganda work. The responsibility for the health services rested with the local authorities, who would strongly resent being obliged to contribute towards the expense of a service which they might not care to apply.

After further discussion, in which Lieut.-Colonel Fremantle supported the claim of the British Social Hygiene Council to a grant from local authorities (see p. 248), the amendment was rejected by 204 votes to 95.

Reduction of Grants to Councils.

The House of Commons on Tuesday, Jan. 29th, again went into Committee on the Local Government Bill. On Clause 86, which gives power to the Minister of Health to reduce grants to councils, if he is satisfied that a council has failed to achieve or maintain a reasonable standard of efficiency in the discharge of its functions relating to public health, Sir LESLIE SCOTT moved an amendment to insert the words "and progress" after "efficiency." He said that the amendment would help the Minister of Health to see that a reasonable standard of progress as well as static efficiency was maintained by the local authorities.—The amendment, which Mr. CHAMBERLAIN accepted, was agreed to.

With a view to defining the public health services which the local authority was obliged to maintain at a reasonable standard of efficiency and progress, Mr. CHAMBERLAIN moved an amendment to insert, after "public health," the words "including services relating to maternity and child welfare, lunacy, and mental deficiency, and the welfare of the blind." He said that tuberculosis and venereal disease were recognised as being covered by the words "public health," and in order to remove any question as to the others he moved their inclusion in the term. The amendment was agreed to.

Sir L. SCOTT moved an amendment to delete from the clause the proviso that the Minister of Health, when dealing with the question of the reduction of grants, must have regard "to the standards maintained in other areas whose financial resources and other relevant circumstances are substantially similar." The words, he said, might be used to tie the hands of the Minister unduly when dealing with the backward authorities. Sir K. WOOD said that the amendment would untie the hands of the Minister for the time being altogether and the operation of the clause would be entirely at his discretion. He could imagine a kind of Minister who might have a very different idea of the standards to be observed in putting the clause into operation. The amendment would also make the point still more difficult from the point of view of the local authorities. The amendment was withdrawn.

On an amendment moved by Mr. LUMLEY, Mr. CHAMBERLAIN said he would consider the possibility of introducing words into the clause to give an opportunity to some outside persons to make representations to the Minister as to the failure of a council to achieve or maintain a reasonable standard of efficiency in the discharge of their public health functions. Such words, however, would have to make it quite clear that the Minister was not dependent on receiving that representation before taking action. At 7.30 P.M. the guillotine fell and Mr. Lumley's amendment was negatived. Clause 86 was added to the Bill. Clauses 87 to 92 were also agreed to.

Temporary Loans.

On Clause 94, which mitigates the liability of councils for temporary loans, Sir K. WOOD moved an amendment providing that, to meet the case of the distressed areas, the rate for the repayment of loans contracted by poor-law authorities to be transferred under the Bill should be 9*d.* in the £ instead of 1*s.* The amendment was agreed to, and the clause added to the Bill.

Transference of Officers.

Clause 99 provides that any person who on Nov. 12th, 1928 (the date of the introduction of the Bill), shall have been an officer of a poor-law authority should, as respects his office, be transferred to the new authority. Mr. HAYDAY moved an amendment to allow officers appointed after the date of the introduction of the Bill to be transferred. He said that an obvious injustice to recently appointed officers would be done if the clause remained as at present. With the long periods of distress, and the epidemics of disease which had taken place, quite a number of officers might have been appointed since Nov. 12th, 1928. Sir K. WOOD said that it would be generally agreed that a man appointed to a poor-law office after the introduction of the Bill, and therefore aware of the provisions affecting his office, was not entitled to compensation for its loss. The amendment was rejected. Under the guillotine the clause was added to the Bill, as were Clauses 100 to 110, inclusive. Of these clauses, 103 provides for compensation to existing officers, and 104 for superannuation of transferred poor-law officers.

The Committee adjourned until Wednesday, Jan. 30th.

HOUSE OF LORDS.

TUESDAY, JAN. 29TH.

Protection of Animals (Amendment) Bill.

This Bill passed through its Committee stage. As amended, it provides that if the owner of any dog should be guilty of cruelty within the meaning of the Protection of Animals Act, 1911, the court, on his conviction, might, in addition to any other punishment, order that the owner, for such time as they directed, should not be granted any licence to keep a dog, and if in spite of that he applied for and got a licence, he could be further proceeded against.

Road Vehicles Regulation Bill.

The House of Lords referred this Bill, which has been read a second time, to a Select Committee of the House. It was stated during the discussion that everyone recognised the need of mitigating the large number of accidents which occurred through motor traffic. The MARQUESS OF SALISBURY stated that the Royal Commission on Transport, now sitting, had undertaken to present an interim report in June or early in July.

HOUSE OF COMMONS.

WEDNESDAY, JAN. 23RD.

Mental Hospitals for ex-Service Men.

Mr. SMEDLEY CROOKE asked the Minister of Pensions if he would consider the advisability of giving institutional treatment in a home provided through the Ministry by the State to those ex-Service men who through war service were now housed in pauper lunatic asylums, providing treatment somewhat on the lines adopted by the British Legion with ex-Service men suffering from tuberculosis, with the ultimate object of enabling them to resume their ordinary occupations as far as possible.—Lieut.-Colonel STANLEY, Parliamentary Secretary to the Ministry of Pensions, replied: All cases (whether of ex-Service men or others), whose mental condition requires certification, and who may need institutional treatment, are required to be dealt with in the mental hospitals provided for under the Lunacy Acts—institutions the description of which as "pauper lunatic asylums" I deprecate most strongly as both inaccurate and needlessly offensive to patients and their relatives. The hon. Member's suggestion has, however, already been met by the provision of not merely one but two special institutions which, with the assistance of the Board of Control, my right hon. friend was enabled to set up, in 1923, in conjunction with the general mental hospitals. These institutions were specifically designed for those cases in which the Ministry are medically advised that a chance

of recovery or improvement is offered by special treatment in the form of occupational training and instruction.

Poor-Law Relief.

Mr. ROBERT MORRISON asked the Minister of Health the total number of recipients of poor-law relief in 1913 and on the last available date.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: The total number of persons (all classes) in receipt of poor-law relief on Jan. 1st, 1913, was 794,227, and on the latest available date (Jan. 5th, 1929) approximately 1,260,000.

Nursery Schools.

Mr. KELLY asked the President of the Board of Education the number of nursery schools in Lancashire, and the number in England and Wales.—Lord EUSTACE PERCY replied: There are four nursery schools in Lancashire and 27 in England and Wales.

THURSDAY, JAN. 24TH.

Poisons and Pharmacy Acts.

Sir ARTHUR HOLBROOK asked the Home Secretary whether the committee on the Poisons and Pharmacy Acts had concluded its sittings; and, if so, when the report was likely to be published.—Sir W. JOYNSON-HICKS replied: The committee has not yet concluded its sittings, and no indication can be given as to the probable date of submission of its report.

Mental Deficiency Committee.

Sir LESLIE SCOTT asked the President of the Board of Education whether the report of the Mental Deficiency Committee, which on July 9th last he informed the House he hoped would be available before the end of the year, had been signed; and when would it be published.—Lord EUSTACE PERCY replied: The report has just been presented. I hope to publish it as soon as practicable, but I understand it is a very long document, and I should not like to give an undertaking to publish until I have had an opportunity of considering it.

Sir LESLIE SCOTT asked whether they might look for the report well on this side of Easter, because there were important conferences to be held in April which would be attended by many people anxious to know about this matter.

Lord E. PERCY: I will certainly do my best; it is a very long document.

Relief of Distress in Mining Areas.

Sir HARRY BRITTAIN asked the President of the Board of Education whether he could make any statement as to the progress of the organisations responsible for the relief of distress in the mining areas.—Lord EUSTACE PERCY replied: Divisional committees have been formed to control the operations of the Lord Mayor's Fund in the following coalfields: South Wales, Durham and Northumberland, Lancashire, Cumberland, West Riding, Somerset and Gloucestershire, including the Forest of Dean, Nottinghamshire, and Derbyshire. Under the divisional committees, local committees have been, or are now being, constituted as required on a basis fully representative of all interests, including the voluntary agencies, for the purpose of obtaining information, preventing overlapping, and securing fair and efficient distribution. The intention is to incorporate as far as possible any existing distress committees into the local committees of the Lord Mayor's Fund, and to restrict the areas covered by those committees so as to ensure that their members can come into personal touch with those who will benefit from the fund. In areas where the density of distress is not such as to justify the creation of a local committee, it is proposed that the divisional committees should enlist the aid of the local education and public health authorities concerned. As regards the central organisation in London, I would refer my hon. friend to the Lord Mayor's speech at the Mansion House on the 16th of this month, of which I am sending him a copy.

Replying to a similar question in regard to Scotland, put by Captain FANSHAWE, Major ELLIOT (Under Secretary of State for Scotland) replied: The Distress in Mining Areas (Scotland) Fund is being administered by a central advisory committee set up at a conference held in Edinburgh on Dec. 22nd. At a meeting of the central advisory committee, held last week, various decisions were arrived at in regard to the policy to be followed in the administration of the fund, and it is hoped to issue a circular to local authorities this week intimating those decisions. In order to secure uniformity of administration as between the different districts, the committee have fixed a scale of household income to be followed by local committees in considering applications for assistance, a discretion being allowed to local committees to exceed this scale in exceptional circumstances. Assistance from the fund may be given either by way of food (which may include feeding of children at school) or clothing, by assisting suitable persons to move to other areas where employment has been found, or by assisting emigration. The central advisory committee have decided to draw up a list of parishes which, for the purposes of the fund, may reasonably be regarded as "mining areas." Within those parishes assistance from the fund will not be limited to miners, and persons in distress in other industries will be entitled to make application for assistance. Outside these parishes, only the claims of mine workers will be entertained. The central advisory committee have distributed £20,000 to local authorities, representing about one-ninth of the present total of the fund.

The Supply of Radium.

Lieut.-Commander KENWORTHY asked the Minister of Health what steps were being taken to see that an adequate supply of radium was available, especially for the treatment of cancer, for the smaller hospitals, and at a reasonable price; and if any steps were being taken to obtain radium in commercial quantities from within the British Empire.

Mr. ROBERT MORRISON asked the Minister of Health if, in view of the fact that the treatment of cancer by radium was being seriously handicapped by the difficulty of obtaining supplies, he had any information as to the possibility of an increased supply and a reduction in the present cost.—Mr. CHAMBERLAIN replied: I am not at present in a position to add anything to the reply given to a similar question on Dec. 5th, in which it was stated that the whole subject of radium requirements and supplies is under consideration by a subcommittee of the Committee of Civil Research.

Lieut.-Commander KENWORTHY: In the meantime is the right hon. gentleman aware that the matter is very urgent for the smaller and poorer hospitals, in view of the tremendous price that the monopoly is charging for this substance?

Mr. CHAMBERLAIN: Yes, I am quite aware of that, and I am trying to get the report as quickly as possible.

Mr. R. MORRISON: Can the right hon. gentleman, for the guidance of voluntary hospitals, issue a statement of the information in the possession of his Department on the subject?

Mr. CHAMBERLAIN: No, I do not think any useful purpose would be served by doing that.

The Extraction of Enlarged Tonsils.

Mr. ROBERT RICHARDSON asked the President of the Board of Education whether, in view of conflicting medical testimony on the advantage or necessity for the extraction of enlarged tonsils, he would recommend local education authorities to bring to the notice of their medical officers the fact that there was an alternative treatment, and advise them not to prosecute parents who desired to follow such treatment rather than have recourse to the operation.—Lord EUSTACE PERCY replied: I do not think the course suggested by the hon. Member is necessary. The medical officers of local education authorities are well aware that there are various alternative methods of treatment for enlarged tonsils, of which operative treatment is one, and operative treatment would only be recommended by them when other methods of treatment had been tried and failed. The position of the Board is indicated in para. 117 of the report of their chief medical officer for 1921, which was repeated in para. 63 of his report for 1923. I would also draw the hon. Member's attention to para. 118 of the report for 1921, and to para. 64 of the report of 1923, in which it is clearly stated that "the Board of Education have consistently advised that operation should not be undertaken except with the full consent of the parents or guardians of the child."

Mr. THOMAS GRIFFITHS asked the Minister of Health whether, in view of the conflicting medical testimony on the advantage or necessity for the extraction of enlarged tonsils, he would communicate to all infant welfare centres the fact that there was an alternative treatment, and that parents who desired to follow such treatment should not be pressed to have recourse to an operation.—Mr. CHAMBERLAIN replied: It is not the practice at infant welfare centres to advise the removal of tonsils, but rather to refer children needing treatment to a hospital or private doctor for advice as to the appropriate form of treatment. I see no reason therefore, to take the action suggested in the question.

Customs Examinations at Victoria Station.

Sir ELLIS HUME-WILLIAMS asked the Chancellor of the Exchequer whether he was aware that the customs examinations at Victoria Station were carried out on the open platform under circumstances which endangered the health of all concerned; and whether he would cause immediate steps to be taken, either by the Customs House authorities or by the Southern Railway Company, to provide some sort of shelter in which the necessary examination of luggage might take place with reasonable comfort both to passengers

and officers of the customs department.—Mr. CHURCHILL replied: As I have explained on previous occasions, the arrangements and provision of accommodation for customs examination at Victoria Station are entirely matters for the railway company.

Sir E. HUME-WILLIAMS: Is the right hon. gentleman aware that for the last three or four years the railway companies have been promising to make proper arrangements for the convenience of passengers, and will he bring pressure—and it will have to be considerable pressure—to bear upon the Southern Railway to carry out the undertakings given?

Sir H. BRITTAIN: Is it not a fact that the customs proceed more expeditiously here than in any other capital?

Mr. CHURCHILL: I have no constitutional means of bringing pressure to bear on the railway company, but I have no doubt that the authorities controlling that railway will follow the debates in this House.

Sir E. HUME-WILLIAMS: The right hon. gentleman is an optimist.

Mr. SIDNEY WEBB: Would it not be correct to say that the existing arrangements are carried on with the approval of the Commissioners of Customs?

Mr. CHURCHILL: I think that that would be going too far.

Arsenal Worker and Nitro-Glycerine Poisoning.

Mr. WILLIAM THORNE asked the Secretary of State for War if his attention had been drawn to the death of Arthur Leonard Ball, of Stratford, a research worker employed at Woolwich Arsenal; if inquiry had been made as to whether death was due to fumes from nitro-glycerine; and if he proposed to take any action to avoid any future occurrence of this character.—Mr. DUFF COOPER (Financial Secretary to the War Office) replied: Yes, Sir. I have seen a report of the inquest at which the coroner recorded in his verdict that the death was accelerated by the deceased having come into contact with some chemical poison allied to nitro-gylcerine. As regards the last part of the question, I am advised that nitro-glycerine poisoning is an extremely rare occurrence, and may imply a pre-disposition on the part of the individual which cannot, unfortunately, be ascertained beforehand. But instructions are being issued that, if any worker feels indisposed as a possible result of contact with the materials he is using, he must at once report the fact to his superior.

Post-Vaccinal Encephalitis.

Mr. GROVES asked the Minister of Health (1) how the death of the boy Wilson, of Castleford, who died in November, 1928, from post-vaccinal encephalitis, and in regard to whom the coroner investigating the death returned a verdict of death from natural causes, had been classified in the official records; and (2) how the death of the boy Crewe, of Poplar, who died recently of post-vaccinal encephalitis, and was certified as having so died by a doctor at the Poplar hospital, had been classified in the official records, seeing that the coroner at the adjourned inquest on Jan. 14th returned a verdict of death from misadventure.—Mr. CHAMBERLAIN replied: The cause of death was certified by the coroner as "post-vaccinal encephalitis" in the first case, and as "post-vaccinal meningo encephalitis" in the second. Both deaths have accordingly been classified under the heading of vaccinia for the purpose of the Registrar-General's mortality statistics.

MONDAY, JAN. 28TH.

Sleeping Sickness.

Sir SYDNEY HENN asked the Secretary of State for the Colonies whether his attention had been called to the fact that Prof. Kleine had organised an expedition to Tanganyika territory, financed by the German government among others, for the purpose of instructing members of mission stations in methods of combating sleeping sickness; whether he had any information which assured him that this expedition was to operate in agreement with the International Sleeping Sickness Bureau at Entebbe; and, if not, whether he proposed to take any steps to make sure that confusion would not be created in the minds of the native peoples by the possible introduction into that country of conflicting methods of dealing with this disease.—Mr. AMERY replied: Yes, Sir. My attention has already been called to a press report regarding a further visit of Prof. Kleine to East Africa. The International Sleeping Sickness Commission, under the auspices of the League of Nations, of which Prof. Kleine was a member, concluded its labours at Entebbe in June, 1927; and its work is being continued there at the charges of the British East African Governments by the Institute of Human Trypanosomiasis Research. Prof. Kleine is not now directly associated with the work at Entebbe, but I do not anticipate that any confusion would arise if he visited Tanganyika.

Chlorine in Foreign Flour.

Lieut.-Colonel HENEAGE asked the Minister of Health if his attention had been called to the use of chlorine for improving certain inferior grades of foreign flour; and if it was proposed to take any action in the matter.—Sir KINGSLEY WOOD replied: My right hon. friend is aware that chlorine is sometimes used for the treatment of flour, but he understands that its use is diminishing, and having regard to such considerations as the danger of increasing the cost of bread and of driving the milling trade abroad, he is not at present proposing to take any action in the matter.

Recruits for the Police.

Captain CROOKSHANK asked the Home Secretary why the height standard for the Metropolitan constabulary was reduced on Feb. 1st; whether there had been any difficulty recently in securing recruits; whether the establishment of the constabulary was being increased; and, if so, by how many.—Sir WILLIAM JOYNSON-HICKS replied: The reason for the temporary modification of the height standard is the difficulty experienced in obtaining sufficient suitable recruits, above the normal minimum of height, to fill the current vacancies in the force. There has been no recent change of establishment, apart from trifling variations.

Caseous Lymphadenitis.

Mr. W. THORNE asked the Minister of Health if he was aware that during the last six months a certain number of sheep from Argentina had arrived in this country with the glands of the legs and shoulders carefully trimmed out and dressed in such a manner that meat inspectors in Great Britain had great difficulty in deciding whether the carcasses were affected or not with caseous lymphadenitis; and whether he would instruct all inspecting authorities that where they found the vital points for inspection had been removed in this manner they should condemn the whole carcass as unfit for human consumption.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied that the Minister of Health understood that the facts were as stated in the first part of the question. The view adopted by his Department and by local authorities generally was that the removal of the lymphatic glands which were likely to be affected with caseous lymphadenitis constituted sufficient evidence to justify the seizure and condemnation of the carcass on account of that disease. The Minister did not think it necessary to issue special instructions to local authorities on this point.

Supply of Radium.

Mr. R. MORRISON asked the Minister of Health whether, in view of the necessity for an adequate supply of radium, he would state when he expected to receive the report of the subcommittee of the Committee of Civil Research.—Sir KINGSLEY WOOD replied: The subc ommittee would not report to the Minister of Health, and he could not say when their report would be received. But the Minister had arranged for the inquiries made on the subject in the House to be brought to the notice of the subcommittee, and he trusted that their report would be available at an early date.

TUESDAY, JAN. 29TH.

No Children Taken.

Miss WILKINSON asked the Minister of Health whether his attention had been called to the fact that an overwhelming proportion of advertisements of rooms to let in London specified no children taken; and whether, in view of the hardship caused to families whose breadwinners must live near their work, he could expedite the building of flats in place of derelict tenement houses in London, and in the meantime introduce such legislation as would make it illegal to specify no children as a clause in a contract for the letting of apartments.—Sir KINGSLEY WOOD replied: My right hon. friend does not consider that the remedy suggested by the hon. Member would be likely to effect its object. The real solution is to increase the amount of available accommodation, and my right hon. friend understands that the London County Council already have under consideration proposals for the erection of dwellings in London for persons who must reside near their places of employment.

Sanitary Condition of Houses.

Miss BONDFIELD asked the Minister of Health if he would introduce legislation to amend the Housing Act, 1925, so as to place the onus of obtaining a certificate that a house was in proper sanitary condition upon the landlord instead of upon the tenant, so that unless a house was really fit for habitation the 40 per cent. post-war increase of rent would not be payable.—Sir KINGSLEY WOOD replied that this

proposal would involve an amendment of the Rent Restrictions Acts. While the Minister of Health had a good deal of doubt as to the merits of the particular suggestion, he could not, in any case, give any undertaking at this stage regarding further legislation affecting those Acts.

Birth Control.

Mr. THURTLE asked the Minister of Health how many resolutions from organisations and local authorities in favour of the giving of birth control information at maternity and child welfare centres had been received by his department during the period of the present Government.—Mr. CHAMBERLAIN replied that resolutions on this subject had been received from 37 local authorities and from 74 other organisations.

Public Health Services.

INFLUENZA.

As will be seen from the summary which follows, the reported number of deaths from influenza in England and Wales has not risen very rapidly in the last few weeks; nothing, in fact, in anyway comparable with the position in Glasgow. In dealing with a non-notifiable disease such as influenza, it is, of course, difficult to ascertain the actual incidence. The death returns under its own heading and that of pneumonia give an indication of its killing capacity, but the extent to which it is interfering with the work of the country can best be ascertained by actual inquiry of those in general medical practice. Such inquiry has during the past few weeks been made of some hundreds of representative insurance practitioners throughout England and Wales, and the replies indicate that in the last few weeks there has been the usual seasonal increase in "colds," but until the first week in the year there was no report of any influenza epidemic. The first locality to report influenza was West Bromwich, and this was followed by Halifax, Caernarvon, Conisbrough, Bristol, Stockport, Smethwick, Manchester, Wigan, Liverpool, Middlesbrough, Sunderland, Kirkby-in-Ashfield, Dudley, Ashington, Ystrad Mynach, St. Leonards, Stoke-on-Trent, Exeter, Plymouth, Southampton, St. Helens, Nottingham, Lincoln, Luton, and Fleetwood. In all cases the disease was described as of a very mild type, although sometimes associated with otitis media; a severe form is mentioned only at Newton Abbot, where one practitioner attributed the deaths of two young patients to "influenza of a virulent type." Numerous other reports from all parts, including London, state definitely that there is no sign of any epidemic incidence. A large business establishment with about 3000 employees, who live in all parts of London, the suburbs and the home counties, and over 2000 spread all over the provinces, reports an absenteeism certified as due to influenza, bronchial catarrh, bronchitis, and feverish cold of less than 2 per cent.

The Glasgow epidemic has been of a more severe type; the reported deaths from influenza during the week ending Jan. 26th being 236. In Belfast, where the epidemic is widespread but mild, there were nine deaths from influenza during the previous week among 11,000 cases. In the United States of America the epidemic of mild type, which commenced in the Western cities and States about the end of November, and spread across to the eastern coast, is now decreasing throughout the country except in the north-west. The experience of Canada has been similar. On the Continent of Europe influenza of a mild type appeared in Germany in December. The incidence in Berlin increased up to about the end of the second week in January, and is reported as heavy, although the mortality was low. Epidemics, all without exception mild in type, have been reported during January in Norway, Sweden, Poland, Denmark, Spain, Finland, and Italy. Reports from most of the remaining European countries state that there is no epidemic incidence.

INFECTIOUS DISEASE IN ENGLAND AN WALES DURING THE WEEK ENDED JAN. 19TH, 1929.

Notifications.—The following cases of infectiou disease were notified during the week:—Small-po 171; scarlet fever, 2547; diphtheria, 1321; enter fever, 38; pneumonia, 1864; puerperal fever, 42 puerperal pyrexia, 113; cerebro-spinal fever, 16 acute poliomyelitis, 11; acute polioencephalitis, 1 encephalitis lethargica, 23; continued fever, 1 dysentery, 5; ophthalmia neonatorum, 112. N case of cholera, plague, or typhus fever was notifie during the week.

The number of cases in the Infectious Hospitals of th Metropolitan Asylums Board on Jan. 22nd–23rd was follows: Small-pox, 31 under treatment, 1 under observ tion; scarlet fever, 1953; diphtheria, 2097; enteric feve 14; measles, 49; whooping-cough, 658; puerperal feve 24 (plus 9 babies); encephalitis lethargica, 76; poliomyelit 5; "other diseases," 43. At St. Margaret's Hospital the were 18 babies (plus 6 mothers) with ophthalmia neonatoru

Deaths.—In the aggregate of great towns, includi London, there was no death from small-pox, 4 (from enteric fever, 33 (1) from measles, 8 (2) fro scarlet fever, 64 (16) from whooping-cough, 56 (1 from diphtheria, 49 (5) from diarrhœa and enterit under two years, and 179 (39) from influenza. Th figures in parentheses are those for London itself.

The number of deaths from influenza during the previo eight weeks was 49, 56, 60, 61, 69, 83, 99, and 122 respe tively, the rate of rise being slightly steeper in the l week. The deaths from influenza in the week under revi again occurred largely in the midland and northern count —Liverpool, 16; Birmingham, 10; Manchester and Bourn mouth, 6; Stoke-on-Trent, Stockport, and Sheffield, each; Birkenhead and Leeds, 4 each. Glasgow report 151, and Belfast 9 during the same week. The 4 deat from enteric fever outside London occurred at St. Hele Bolton, Manchester, and Bradford. Cardiff reported deaths from measles, Liverpool 6, and Newcastle-on-Ty 5. Salford reported 5 deaths from whooping-cough, H 4, Burnley, Leeds, and Carlisle 3, each. Deaths from dip theria were reported from Liverpool (5), and Birmingha (4). Seven deaths from diarrhœa occurred at Liverpo 4 at Manchester. In the monthly statement of deat from small-pox it is noted that for the month of Decemb one death each was reported from Oswaldtwistle U. and Droitwich R.D., and provisionally classified to small-p

The number of stillbirths registered during the we was 288 (corresponding to a rate of 42 per 10 births), including 51 in London.

ROYAL MEDICAL BENEVOLENT FUND.—As gran are made from the income received from subscriptions a donations, subscribers to this Fund are asked to forw their contributions during the first quarter of the ye rather than later, in order that the amount available distribution may be known and a possible overdraft at t bank avoided. At the last meeting of the Case Commit 35 applications were considered, and 32 grants were vot amounting to over £951. The following is a résumé of th cases:—

An M.R.C.S. died in 1926, leaving a widow and two childr a girl aged 16 and boy aged 13. The widow is now support herself in domestic service. The Fund was asked to assist in education of the two children, £45 being required for the boy £36 for the girl for her last two terms. The Fund voted £40, to each child, and is arranging with other societies to coöper and to contribute the balance required.

Wife, aged 37, of L.M.S.S.A. The husband has had a compl mental breakdown and is subject to dementia paralytica. T wife has no private means and has a girl of 7 years to educ Her father-in-law is making an allowance of £39 per ann whilst the Freemasons are giving £26 and other charities £ making a total of £80. Fund voted £26 and have referred case to the Royal Medical Benevolent Fund Guild to arra for the education of the child.

Daughter, aged 68, of M.R.C.S. Since the death of her fat the applicant has had to live on £53 a year. Bad eyesight deafness have prevented her from working for a living and consequence of her privations her general health has suffer Owing to her increasing infirmities she will soon have to h someone to attend to her wants. Her income has recently b increased to £73 p.a. Fund Voted £26.

Subscriptions and donations should be sent to the Honor Treasurer, Sir Charters Symonds, at 11, Chandos-str Cavendish-square, London, W. 1.

Correspondence.

"Audi alteram partem."

OUR HOSPITAL SYSTEM.

THE SILENT REVOLUTION.

To the Editor of THE LANCET.

SIR,—Since the year 1844 the poor-law system of this country has remained in much the same state. The fundamental principles then laid down the conditions necessary for the reasonable treatment of the poor; many and great changes have occurred during the past 80 years.

The working man, then included among the poor, has ceased to be regarded as one to whom assistance is to be given more or less regularly, year by year, out of the rates. He, indeed, was under exceptional circumstances entitled to the advantages conferred by those laws, but no longer is he in need of many of them. Further, by his own efforts he has secured a position in the country which commands the respect of all citizens, for he has made provision for himself during times of sickness, in the periods of unemployment, and in his old age. There remains, however, one direction in which he has not been able to secure what is to-day most desirable for him. That is institutional hospital treatment when sick or injured. Time was, and that not long since, when diseases, major as well as minor, could be and indeed were treated in the home, however inadequate the accommodation might be, and for such domiciliary treatment the working man has since the middle of the last century made more or less satisfactory provision. Such treatment of disease as he could manage to pay for and such accommodation as he could secure in his own house are to-day not only thought to be inadequate but known to be insufficient and far from what is desirable and what should be provided for him. The sailor and the soldier are provided for in a manner worthy of this great State; and our working men should be equally well provided for, not only in their own interests, but also in that of the economic interests of our many if not all industries.

No longer can it be contended that the cottage in the country or the small house in the town is a fit and proper place for the retention and the treatment of sick members of the working man's family. His house is small enough for those who dwell in it when the members are well, but it is totally unsuitable for the accommodation of any sick as well as the healthy members. It is in that direction that the next need of the working man presents itself. The accouchements of his wife require the healthiest and best of surroundings so that the mother may speedily recover and the child be properly attended to in the early days of its existence; and both he and every other member of his family, when sick, need a place where they can receive skilful attention and care in nursing with every medical service and requisite that may be necessary. In no way can such service be secured for him and his family except by the establishment of hospitals on a sufficiently large scale where the best possible treatment—medical, surgical, dental, and in all other accessory branches—are provided. That provision, if made on an ample scale, would crown the work that was started by the provident societies—a work so well conceived and carefully executed in the last century.

The big hospitals—infirmaries as they are called—grudgingly provided under the poor-law system and now about to be dissolved with that organisation, have partially supplied the needs of the large towns and cities. They, however, have never been developed by the medical profession in the manner they should have been and in one that the authorities have ever been sympathetic with. Soon these hospitals, some of the first order, will all come by transference under the government of the county councils, and the county councils may under the new conditions combine to create adequate hospital accommodation, not only for the treatment of fevers, tuberculosis, &c., but for ordinary medical and surgical diseases and for a maternity service that should come up to a standard worthy of this country and suitable to meet the needs of our people.

The union infirmaries are passing away; the infirm require new accommodation and the sick need ample provision for their treatment. The dissolution is at hand. Is the reconstruction in hand? I fear not, and my fear is based upon the well-known ultra-conservative nature of the medical profession. In 1844 the great doctor teachers in London were the means of preventing the construction of adequate hospitals for the people, and their excuse was that the voluntary rather than charity hospitals with medical schools attached would be interfered with and might well be ruined, and medical education with them. To-day there is the same conservative feeling expressed by a few who think they foresee that the voluntary hospitals, as they are called to-day, would be damaged and their chief excuse for endeavouring to obviate that result is that only such hospitals can command the services of the best physicians, surgeons, accoucheurs, dentists, &c., for in them alone lies the true incentive to do the best work. What folly! Is there no work, like that to be seen in the British voluntary hospital, to be also seen in France, Germany, Italy, and elsewhere? Of course there is, and there would be the proper incentive in this country in such hospitals as the county councils, singly or in combination, might establish, equip, and run.

By the furtherance of the development of such hospitals the medical profession stands, I believe, to gain, and such a degree of gain as it has never known before. The present voluntary hospitals are no longer called charity hospitals, and the charity subscriptions are here, there, and everywhere being rapidly replaced by weekly contributions from working men, the result of their provident instinct, if I may say so, to make provision to meet future needs. It should be recognised that the medical schools attached to these hospitals are, even to-day, totally inadequate to give the aspirants to the medical profession the technical training—not book education and laboratory technique, be it noted—every doctor should receive before he is certified as fit to undertake doctoring duties on his own. It is indubitable that inadequacy in clinical facilities could, under present conditions in the hospitals with medical schools attached, be in great part, if not wholly, done away with were the coming county council hospitals provided with an organisation of experienced teachers for the further clinical training of medical students who would be able to satisfy examiners that they possess adequate knowledge to profit thereby. Such hospitals could then become institutions supplementary to our great medical schools, and would provide adequate and more than adequate means for gaining proficiency in the practical work so necessary in the profession of medicine. Additional opportunities are a great need, even greater to-day than ever before, owing to the enormous accumulation of knowledge in every direction in subjects which form the basis of medicine. That knowledge, as doled out at present, takes considerable time to acquire, and there is, in consequence, less time available for the student to devote to the training in the practical work of investigating and treating diseases. Proficiency in the art and practice of medicine cannot be attained without repeated experiences, and opportunities for these should be available, at any rate for all the best pupils preparing for the higher branches of the profession.

I am, Sir, yours faithfully,

Cambridge, Jan. 23rd, 1929. JOSEPH GRIFFITHS.

HENRY HICKMAN MEMORIAL FUND.

To the Editor of THE LANCET.

SIR,—The committee has decided not to close this fund at the end of January as provisionally stated.

From a contributor in Canada we gather that there may be medical men abroad, and in the Colonies, who wish to send a donation to the fund, and who have not yet had time to reply. The number of contributors has so far been disappointing. Without anæsthesia, the great achievements of present-day surgery would be impossible. We ask for further support, not only to recognise Hickman officially for the first time, but to claim this pioneer work for an Englishman, and in so doing to stimulate original work in anæsthesia. The hon. treasurer of the fund is Mr. V. Warren Low, F.R.C.S., 76, Harley-street, W.

I am, Sir, yours faithfully,

CECIL HUGHES, M.B.,
Hon. Sec., Hickman
London, W., Jan. 28th, 1929. Memorial Committee.

PROF. FERNAND WIDAL.

To the Editor of THE LANCET.

SIR,—In the obituary notice in your last issue Fernand Widal is given the title of *Professeur agrégé*. This is an error. Widal was *Professeur titulaire*—and this is not at all the same thing. The appreciation of the original work of Prof. Widal which follows is also not very precise, and hardly gives a fair estimate of the work done by this physician. The precise facts are the following :—

In 1889, when he was assistant physician to the hospitals of Paris, Widal showed the importance of the streptococcus in the genesis of puerperal phlebitis. In the same year he demonstrated with Chantemesse the possibility of vaccinating animals against typhoid infection by using vaccines made of microbes killed through the medium of heat, giving thus the basis of the prophylactic and of therapeutic vaccination. On June 26th, 1896 (therefore some months before the publication of A. S. Grünbaum), Widal introduced the agglutination reaction for the diagnosis of typhoid fever, and the fact that the whole world knows this reaction as "Widal reaction," and that even the Germans call it "Gruber-Widal," demonstrates sufficiently the rôle of the French physician in the discovery of this valuable method.

The most important work of Widal is probably his work on nephritis. He first demonstrated the rôle of salt in the genesis of œdema, and although since then theories on œdema have changed and will change, the clinical fact of the rôle of salt-free diet will remain as a permanent acquisition of science. Pushing his work further, Widal succeeded to free nephritis from the exclusive, and sterile therapeutically, anatomopathological point of view, and introduced his famous conception and analysis of the physiopathological syndromes of nephritis, isolating principally the azotæmic type and showing the diagnostical and prognostical significance of the variations of urea nitrogen in the blood. In 1900, with Ravaut and Sicard, he introduced the method of cyto-diagnosis of the exudates. In 1907, with Abrami and Brulé, he made a series of important works on the hæmolytic jaundice. In 1913 he started his researches on anaphylaxis, which would have remained a laboratory phenomenon, or at all events would have been limited to serum disease if Widal had not thrown into this work his clear intuition and his experimental genius. It is well known that thanks to this work on anaphylaxis and that of the importance of the disturbance of the colloidal equilibrium in the blood, medicine has been transformed by a sort of renovation of the old humeral pathology of the Greeks, and the treatment of a great number of diseases has largely benefited by the anti-anaphylactic medication.

I can only indicate the principal researches of Widal, but, in fact, there is no branch of medicine which has not benefited by his work, and all those who have followed the medical movement of these last years cannot agree with the words of your collaborator that "Widal achieved a reputation for original research which perhaps he hardly merited." On the contrary, this reputation is amply justified by the great original work of Widal.

Fernand Widal was eminently a representative of the great clinicians of the Paris school. He was not only an original worker, but a brilliant diagnostician and a remarkable teacher. As a consultant he was known even in the remotest corners of the world, and when some years ago he travelled through South America, he was received with real royal honours. He had great clinical tact, and I have had the occasion to appreciate this quality in a very dark period of the history of Greece, when Widal had been called, too late unfortunately, at the sick-bed of the late King Alexander. As a teacher he had made of the medical clinic of Cochin Hospital a centre of study and work for physicians coming from all parts of the world.

The man was as great as the physician ; although covered with glory and honours, Member of the "Institut"—the highest French scientific honour—Great Cross of the Legion of Honour—the highest French civil honour—he kept to the last days of his life his simplicity and sympathetic disposition, ready to help anyone, great or small. He loved his calling ; he was a fervent but not a narrow patriot, and a valuable friend.

I am, Sir, yours faithfully,

A. P. CAWADIAS.
Wimpole-street, W., Jan. 29th, 1929.

ASTHMA RESEARCH.

To the Editor of THE LANCET.

SIR,—That anyone, least of all a psychologist, should have been able to read into my letter and link up my name with the word "pessimism" is so astonishing that lesser misunderstandings may be excused. I have many failings, but never before in all my life have I been called a pessimist.

Referring to that portion of my letter, which Dr. Millais Culpin takes as a text for his short sermon, my point is that the asthmatic is not a neurotic, nor does he suffer from nervous manifestations, nor, but for very exceptional cases, is he in need of that ample assistance Dr. Culpin and his fellow practitioners can doubtless afford to the true neuropath.

Neurotic tendencies were wrongly imputed to the asthmatic in the past by a profession which was totally ignorant of the main causes of asthma as now recognised. When the patient said that cats gave him asthma, he was disbelieved ; now, by means of the skin reactions, full justification of his statement is possible. Dr. Culpin seems anxious to know what degree of stigma I personally attach to the adjective "nervous." My answer is, a very great deal. If the number of neurotics in the world were doubled, the health of society at large and the peace of the individual at home would be very adversely affected ; if it were halved, the nation would be far happier. Therefore, the neurotic is not an element for good, and in so far as he fails to add his quota to the general happiness of the world, so far is he a nuisance, and so far do his nervous manifestations carry a stigma.

I made no attempt in my letter to include all the possible methods of curing asthma, but because I did not mention psychotherapy it does not follow that I am totally ignorant of that science. Nor is it impossible that some of us may arrive at useful conclusions by sympathetic questions and by lesser methods than by stirring up the deeper pools of memory with a long stick and grabbing the dead leaves as they come to the surface.

As my views on psychology cannot be of the least interest to anyone, I will close with an article of faith. In my opinion it is of far greater value to 99 asthmatics out of every 100 to know whether they are sensitive to feathers, if they can take aspirin, if their tonsils are healthy, and such like very material questions, than to undergo a course of psycho-analysis. I am, Sir, yours faithfully,

Jan. 28th, 1929. FRANK COKE.

THE TREATMENT OF HÆMORRHOIDS BY INJECTION.

To the Editor of THE LANCET.

SIR,—Dr. Whitcombe asks how it is possible for injection of hæmorrhoids to "deal with those cases, very common, in which there is a large protruding œdematous mass of rectal tissue, showing bleeding ulcerative piles higher up," and expresses the hope that Mr. Christopher Howard and I will try his method of galvano-puncture. Let me assure him that I am treating cases such as he describes almost daily, and that if he will do me the honour of reading my book he will discover details of the method I follow.

Dr. Whitcombe does not improve his case by misquoting what transpired at the joint meeting of the Proctological Subsection of the Royal Society of Medicine and of the American Proctological Society.[1] The late Mr. Græme Anderson gave his recurrence rate as *15 per cent.*; Dr. Jack Halton, of Florida, believed that *nine-tenths* of uncomplicated cases were cured; Mr. Perrin said that 50 per cent. were absolutely cured, and a little over 30 per cent. were "substantially cured, but complained of trivial symptoms"; Dr. Zobel (San Francisco) believed that a few were cured, but nearly all were relieved and, if recurrence took place patients were usually willing to submit themselves to further treatment. Only one of the speakers reported expressed himself strongly against the treatment. All were dealing with the old interstitial injections, and most of them were using 10 per cent. carbolic in glycerine and water, which I have repeatedly pointed out is, in my experience, too weak and more often ineffectual than the 20 per cent. solution which I used to employ.

When Dr. Whitcombe sums up this discussion by writing that "the general opinion was that the method was only of use in simple uncomplicated cases,and that recurrence followed in some 50 per cent." he is hardly giving a fair and accurate account of the opinions actually expressed. Nor does he refer to my own figures which have been published in my book and elsewhere.[2] I ascertained that three years and upwards after treatment 83·4 per cent. remained free from even trivial symptoms, and that of the remaining 16·6 per cent. a large proportion had such trifling inconveniences as "a sense of heat after defæcation," itching, &c. Whilst misrepresenting the opinions given at the meeting to which he refers, and whilst failing to mention my own figures, Dr. Whitcombe gives no information about the number of cases he has treated by his own method, his own percentages of successes and failures, nor his method of selecting cases. That he has, at any rate, some recurrences and failures I know, because several of his cases have afterwards drifted into my own hands—some immediately after treatment by Dr. Whitcombe and others at longer or shorter intervals.

In a recent paper on the treatment by galvano-puncture by Dr. Whitcombe[3] reference is made to a patient on whom he had to use the cautery on "about a dozen different occasions, but the prolapse gradually subsided, and in two months the patient had completely recovered." This means that by his method over twice as many treatments are required and relief is far less prompt than is the case when submucous injections are used. In the same article Dr. Whitcombe mentions an alarming list of complications after galvano-puncture, including three cases of *secondary* hæmorrhage, which Dr. Whitcombe assumes occurred because the patients must have been hæmophiliacs. Since I have used the *submucous* injection of 5 per cent. carbolic acid in oil I have had no case of secondary hæmorrhage or of sloughing and I have also eliminated the cases of severe pain, which occurred in a small percentage of cases treated by the interstitial injection of stronger solutions in glycerine.

In these circumstances Dr. Whitcombe must forgive me if I decline his invitation to give his method of galvano-puncture a trial—at any rate, until he has published his own figures as regards recurrences, frequency of complications, the average number of treatments necessary, and so on.

I am, Sir, yours faithfully,

ARTHUR S. MORLEY.

Upper Wimpole-street, Jan. 26th, 1929.

[1] THE LANCET, 1924, ii., 117.
[2] Practitioner, June, 1922.
[3] Brit. Med. Jour., 1928, ii., 1035.

HEINE, THE STRANGE GUEST.

To the Editor of THE LANCET.

SIR,—While thanking you for your appreciative review of my book, may I be permitted to allude to one sentence, wherein the otherwise excellent compositor has, it would seem, omitted an all-important "not"? You say that my book "should lead many who can read German to enjoy the poet's gay and serious phases, his wit, his penetration, and his lovely literary gift." I was under the impression that my book is written in English; and, if so, the omitted word would come after "can." But one never knows. There was a very famous British general who, in the war, convened a number of his own and of French officers. The second part of his discourse he delivered in what he thought fairly decent French; and at the end of it a French colonel jumped to his feet and exclaimed that, as this was doubtless a very noteworthy pronouncement, it should be, without a moment's delay, translated into the French language. I am, Sir, yours faithfully,

Jan. 27th, 1929. HENRY BAERLEIN.

*** We regret the slip; the "not" was intended.—ED. L.

Obituary.

FRANK MORT, M.B. GLASG.

Dr. Frank Mort, who died on Jan. 22nd, after a few days' illness, had been for many years well known in Middlesbrough, first as a general practitioner and later as a cardiologist. A graduate of the University of Glasgow he qualified in 1895, and after several sea voyages settled in the North of England, soon gaining a high reputation among his patients and showing an unusual diagnostic skill. At first, apart from general medicine, he made a specialty of obstetrics and gynæcology, but the ultimate goal of his ambition was the study of electro-mechanics and the neuro-physiology of the heart. He qualified for work as a cardiologist by post-graduate study in London and Vienna, where he worked with Dr. Dressler and Dr. Rösler. At the time of his death he was preparing an address embodying some of the work which he had undertaken with so much enthusiasm and skill during the past few years. Many in Middlesbrough will feel that by Dr. Mort's death they have lost a friend and counsellor. He is described as a "true physician; kindly, humorous, painstaking to a degree," and at his funeral men and women were seen weeping in the streets.

JAMES MUNCE, L.R.C.P. EDIN.

MEMBERS of the medical profession in Ulster have learned with deep regret of the death, from pneumonia, on Jan. 20th, of Dr. James Munce, of Lisburn. Born in 1868, he was the son of the late Mr. Robert Munce, of Newtownards; he received his medical education at Queen's College, Belfast, and afterwards in Dublin and Edinburgh, taking the diplomas L.R.C.P. and L.R.C.S. in 1896. As a student he was a well-known lacrosse player and played for the famous Ards Club. He became medical officer of Druinbeg Dispensary in 1900, and continued in this office until his death, gaining the confidence and affection of a very wide circle of patients and friends; he was a sound physician

and a particularly reliable anæsthetist, serving the County Antrim Infirmary in this capacity for 25 years. Not the type of man to seek popularity, few gained it more easily, and he was trusted by his medical colleagues.

Dr. Munce married Elizabeth Campbell, daughter of the late Mr. N. Perry, of Saintfield, and she survives him.

JOHN WATSON SIMPSON, M.B. EDIN., D.P.H.

AFTER a period of poor health Dr. Watson Simpson died at Birmingham on Jan. 11th at the age of 38, his early death being attributed partly to the effects of war service. An Edinburgh man, he represented the University at Rugby football, and but for an accident would have been chosen to play for Scotland. Graduating in 1915, he served in Egypt and Palestine, where he was badly gassed, and by this and other illness his constitution was so seriously affected that for the future he could not take part in athletics. In 1922, after taking the D.P.H., he secured the appointment of assistant medical officer for the county of Warwick, and was later given charge of the venereal diseases department of the Hospital of St. Cross at Rugby. School inspection occupied much of his time and interest, and in this connexion he won the respect and liking of both teachers and parents. Dr. Simpson leaves a widow and three children.

VICTOR GUSTAVE PLARR.

LIBRARIAN OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

WE much regret to announce the death of Mr. Victor Gustave Plarr, who has been Librarian at the Royal College of Surgeons of England for over 30 years, which occurred on Monday last, Jan. 27th, at his house in Wimbledon, in the sixty-sixth year of his age.

Victor Plarr was the son of an Alsatian savant and mathematician and was born near Strasbourg on June 21st, 1863, his mother being the daughter of a Lombard-street banker. The father, whose house was burnt in the Franco-German War, came to Scotland when his son Victor was 7 years of age, and became a naturalised British subject, while the son received his education at St. Andrews, and later at Tonbridge School, where he was a Judd exhibitioner. From school he proceeded to Worcester College, Oxford, and in 1886 graduated with honours in the Modern History school.

The whole of Victor Plarr's life was devoted to letters. He had many contemporaries at Oxford, who, out of inclination, necessity, or both, made literature their profession, and Plarr as a young man was a member of a group of free-lance writers and became the author of a good deal of verse, some interesting essays, and translations from the Greek and from the French, which was for him a second language. He was made editor of a valuable compilation, "Men and Women of the Time," a predecessor of "Who's Who," and in 1890 was appointed librarian at King's College, London. This post he held for seven years, when he took the post at the Royal College of Surgeons, in connexion with which his name is known to every member of the medical profession who has had need of expert assistance in the literature of the profession. He is responsible for about half of the now completed catalogue of the books in the College library, and for a complete catalogue of the manuscripts. A projected compendium of the lives of the Fellows of the College he completed in manuscript, bringing the biographical records up to 1922. He was a valued editorial contributor to our columns for a quarter of a century.

Plarr's kindly though cynical wit, wide range of literary and artistic accomplishment—for he was a good pastellist—tolerance of honest effort, and contempt for pretentiousness, made of him a delightful and stimulating companion, and his death will be regretted by a large circle of friends in private life, in official circles, and at the Athenæum.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Vice Admiral Arthur Gaskell, C.B., O.B.E., Medical Director-General, has been appointed an Honorary Surgeon to the King.

Surg. Lt. (D.) C. Williams to be Surg. Lt.-Comdr. (D.).

D. F. Walsh to be Surg.-Lt.

The following appointments have been made: Surg. Comdr. G. R. McCowen to *President*, for post-graduate course.

Surg. Lt. E. H. Rampling to *Victory*, for R.N. Barracks, Portsmouth, temp.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub.-Lieut. E. H. Parkinson to be Surg. Sub.-Lieut.

The following appointment has been made: Surg. Lt. H. O'Connor to *Victory*, for R.N. Hospl., Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Maj. B. H. H. Neven-Spence, Reg. Army Res. of Off., relinquishes his appt. under Art. 507 (b), Royal Warrant for Pay and Promotion, 1926.

Capts. J. R. S. Mackay (Prov.) and A. K. Robb to be Majs.

Capt. W. I. F. Powell from the Sudan Def. Force to the Egyptian Army and remains secd.

TERRITORIAL ARMY.

Maj. W. Campbell, R.A.M.C., to be Divl. Adjt., 51st (Highland) Div., T.A., vice Maj. F. C. Chandler, R.A.M.C., who vacates the appt.

Capt. W. Y. Eccott, R.A.M.C., to be Divl. Adjt., 48th (S. Mid.) Div., T.A., vice Maj. J. H. Fletcher, R.A.M.C., who vacates the appt.

Capt. E. J. S. Bonnett, R.A.M.C., to be Divl. Adjt., 49th (W. Rid.) Div., T.A., vice Maj. H. A. Sandiford, R.A.M.C., who vacates the appt.

Lt. A. Angus to be Capt.

ARMY DENTAL CORPS.

E. C. Irish to be Lt. (on prob.).

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. R. B. Purves, having attained the age limit retires, and retains his rank, with permission to wear the prescribed uniform.

Maj. J. H. Thompson, having attained the age limit, relinquishes his commn. and retains his rank.

ROYAL AIR FORCE.

Squadron Leader J. C. Osburne is placed on the retired list on account of ill-health.

Flight Lt. E. G. Howell is transferred to the Reserve, Class Dii.

INDIAN MEDICAL SERVICE.

Capt. J. S. Galvin to be Maj.

Lt.-Col. W. R. Battye retires.

A MEDICAL TOUR TO THE POLAR CIRCLE.—In response to a wish expressed by previous participants in the tours which are annually organised by the journal *Bruxelles-Médical*, the next tour will visit the Polar Circle, and will last 24 days. The itinerary will allow the paying of visits to some of the prettiest fjords in Norway, the Lofoten, the Faroe, and the Shetland Islands, and will end with the Firth of Forth and Edinburgh. The *Brazza*, "*paquebot de luxe*," will start from Bordeaux, but the trip commences at Zeebrugge on July 13th. The following fjords will then be visited: Norheimsund, Bergen, Gudvangen, Balhom, Loe, Merok, and Andaelsnaes by July 23rd, Svartisen and the Polar Circle being reached two days later. The *Brazza* will then visit Digermulen and Thorshavn and the Shetland Islands, Edinburgh being arrived at by July 31st. The trip will terminate where it began on August 4th. Anyone can join the *Brazza* at Bordeaux on payment of a small addition to the price of the fares, which are quite moderate—indeed one-third lower than the usual price charged for similar tours. Two classes are provided, and the whole tour for medical passengers will cost from 2500 fr. to 5375 fr., according to the class occupied. These prices are specially made for doctors, their wives, and unmarried children.

Medical News.

UNIVERSITY OF LONDON.—At a meeting on Jan. 23rd the Senate accepted, with thanks, an offer of the committee of the Bayliss-Starling Memorial Fund of the sum of £2500 for the establishment at University College of a scholarship for training in physiology and biochemistry to commemorate the connexion with physiology of Sir William Bayliss and Dr. E. H. Starling, formerly professors at that College.

It was resolved to institute an Academic Diploma in Clinical Pathology.

The degree of D.Sc. in Anatomy was conferred on Dr. H. A. Harris, assistant professor of anatomy at University College, for a thesis in the form of a series of memoirs dealing with the problems of bone growth, radiology, and teratology.

Mr. A. Sterling Parkes, D.Sc., was awarded the William Julius Mickle Fellowship for 1929, in respect of the work he has carried out during the past five years on the physiology and biochemistry of the organs of reproduction.

A report was received from the committee appointed by the Senate to inquire into the medical education of women (see p. 251).

UNIVERSITY OF LIVERPOOL.—A Fellowship in the Faculty of Medicine for research in tuberculosis in children has been endowed by the gift of £2000 by the trustees of the late Mrs. Ridgway.

UNIVERSITY OF MANCHESTER.—With the concurrence of the board of management of the Manchester Royal Infirmary the council has appointed Dr. J. F. Wilkinson to be director of the Laboratory of Clinical Investigations. Dr. Jethro Gough has been appointed Demonstrator in Pathology.

COLLEGE OF PESTOLOGY.—At a luncheon to be given on Feb. 20th at the Hotel Cecil, London, Mr. A. Moore Hogarth, chairman of the college, will receive a presentation of his portrait in oils. The presentation will be made by Sir James Crichton-Browne, F.R.S., the first president of the college.

GERMAN BALNEOLOGICAL SOCIETY.—At the jubilee congress of the Deutsche Balneologische Gesellschaft lately held in Berlin, Dr. R. Fortescue Fox was elected an honorary member of the society. The French Ministry of Health was represented at the meeting by Dr. Frenkel, and the Société d'Hydrologie Médicale by Dr. Macé de Lépinay and Dr. Glénard.

OLIVER STUDENTSHIP IN BOTANY.—After 40 years' service as Quain Professor of Botany, University College, London, Prof. F. W. Oliver will retire from this post at the end of the present session. Prof. Oliver succeeded his father, so that the chair of botany has been filled by father and son for 68 years. A special effort is being made to raise a permanent memorial associated with their name, and to this end a committee of his past and present colleagues and students has been formed. The scheme is to found a Studentship in Botany open to post-graduate students of the University of London, and in addition, to make a personal gift. Contributions to this fund should be sent to Dr. Paul Haas, at University College, Gower-street, W.C.

JOINT TUBERCULOSIS COUNCIL.—At a meeting of the Council held on Jan. 19th, Sir Henry Gauvain was elected chairman for 1929; Dr. G. Lissant Cox, vice-chairman; Dr. Ernest Ward, hon. secretary; and Dr. James Watt, hon. treasurer. A report on behalf of the employment committee was presented by Dr. J. B. McDougall, and in the discussion which followed Dr. Varrier-Jones emphasised the importance in colony work of providing opportunities to those of them who showed exceptional ability to rise to the position of supervisors and teachers. The committee was asked to report on after-care, including employment schemes and the employment of ex-patients in residential institutions. Dr. Lissant Cox's valuable memorandum on the "Fate of Young Children in Tuberculous Households" was further discussed. Concerning post-graduate study, Dr. W. Brand reported that during 1928, 14 had attended the course at Alton, 18 at Papworth, and 30 at Victoria Park Hospital. For 1929 he proposed more than one course in surgical tuberculosis, a course in artificial pneumothorax therapy and the interpretation of radiograms, and a course at the University of Paris during Easter.

STAMFORD INFIRMARY.—With the exception of a wing recently erected, this hospital is to be converted partly into a nurses' home and partly into staff quarters, and a new block is to be put up containing 44 general and six private beds. The cost will be £17,000.

EAST LONDON HOSPITAL FOR CHILDREN.—There will be a clinical afternoon at this hospital at Shadwell at 4 P.M. on Wednesday, Feb. 6th. Some Blood and Skin Diseases will be the subject. Medical practitioners are invited, and tea will be served at 3.45 P.M.

A "STAFF FUND."—The North Walsham and Gimingham Sunday and Saturday Hospital Fund has given £40 to the North Walsham and District Hospital as the nucleus of a "staff fund" from which to pay the out-of-pocket expenses of consultants called in from a distance, and others who give unpaid services.

INTERNATIONAL SOCIETY OF EXPERIMENTAL PHONETICS.—The first annual Conference Week of this society will be held in Hamburg from July 24th to 31st. Membership of the society is open to all persons, institutions, libraries, and corporations (commercial and otherwise) who are interested in the subject. Communications should be addressed to the President, Prof. E. W. Scripture, Strudelhofgasse 4, Vienna, or 25, Howard-road, Coulsdon, Surrey.

LONDON INTER-COLLEGIATE SCHOLARSHIPS BOARD.—This Board announces that an examination for nine medical scholarships and exhibitions, of an aggregate total value of £1170, will commence on April 16th. They are tenable at University College and University College Hospital Medical School, King's College and King's College Hospital Medical School, and the London (Royal Free Hospital) School of Medicine for Women. Full particulars and entry form may be obtained from the Secretary of the Board, Mr. S. C. Ranner, the Medical School, King's College Hospital, Denmark-hill, S.E. 5.

SWINEY PRIZE FOR JURISPRUDENCE.—The Swiney prize for 1929 has been awarded by the adjudicators, the Royal Society of Arts and the Royal College of Physicians, to Dr. Sydney Smith, Regius Professor of Forensic Medicine in the University of Edinburgh, for his work, "Forensic Medicine." Dr. Swiney, who died in 1844, left a sum of money to the Royal Society of Arts to provide a prize every fifth year for the best published work on jurisprudence. The prize, which consists of £100 and a silver cup of the same value, was offered this year on the 85th anniversary of the testator's death for a work on medical jurisprudence.

THE QUEEN AT MIDDLESEX HOSPITAL.—On Thursday in last week the Queen laid the foundation-stone of the new Nurses' Home of the Middlesex Hospital in Foley-street, W. An anonymous benefactor has given £200,000 towards the cost of erecting the building, which will accommodate 450 sisters, nurses, and maids, and will contain rooms for teaching purposes. Every bedroom will have hot and cold "running water," wireless will be installed in the recreation rooms, and there will be a Badminton court on the roof. A sealed envelope containing the benefactor's name was placed within the foundation stone.

PRESENTATION TO A MEDICAL MAN.—Dr. Percy Coleman, of Clacton-on-Sea, who for 30 years has been connected with the Clacton and District Hospital, has been presented with his portrait in oils, an album containing the names of the 335 subscribers, and a wallet containing the residue of the fund. The presentation was made at a largely attended meeting at the Grand Hotel, Clacton, presided over by Brigadier-General K. J. Kincaid-Smith, and attended by the medical practitioners and well-known people of the town. During the evening many tributes were paid to Dr. Coleman's work both for the hospital and in the town, and Mrs. Coleman was presented with a basket of flowers. The portrait is the work of Mr. Harold Knight, A.R.A.

MEDIÆVAL TOWNS AND SPAS OF GERMANY.—A Whitsuntide round of visits to certain well-known mediæval towns and medical spas of Germany is being organised by Mr. Henry Baerlein, who has already arranged successfully for the visit of mixed parties of medical and lay men and women to Jugoslavia and Czecho-Slovakia. The tour, which will start on Tuesday, May 14th, will last 21 days, and a detailed itinerary will be published later in these columns. Among the places visited will be Hildesheim, Brunswick, Goslar, the Brocken, Weimar, Kissingen, Nuremburg, Rotenburg, Wurzburg, Heidelberg, Frankfort and Bad Nauheim, Homburg, Wiesbaden, and Cologne. Already Mr. Baerlein can supply much detailed information, and he will do so in reply to communications addressed to him at the Bath Club, 34, Dover-street, London, W. 1.

Dr. P. S. SELWYN-CLARKE, *M.C.*, of the West African Medical Staff, was called to the Bar at Gray's Inn on Jan. 28th.

ULSTER MEDICAL SOCIETY.—At a meeting of this society at Belfast on Jan. 24th, Mr. Harry Platt (Manchester) read a paper on Some Tendon and Muscle Ruptures. In the course of his address he pointed out that what is usually diagnosed as rupture of the plantaris tendon is almost always rupture of the gastrocnemius muscle, the correct early treatment being compression by strapping or bandage, limited exercise, and early massage; that injuries to the short head of the biceps are not uncommon in young subjects—e.g., footballers—and that the symptoms are frequently obscure for 48 hours; that insidious rupture of tendons by osseous change—e.g., in arthritis—or by tenosynovitis may occur, notably in the tendon of the extensor longus pollicis (the kettle-drummer's paralysis of German authors). He described his operation for the cure of this condition by the construction of a pulley and a new site for the tendon, illustrating this by lantern-slides.

DONATIONS AND BEQUESTS.—Miss Charlotte Elizabeth Peck, of Cecil-road, Preston, Birkenhead, left £21,766, and, subject to various private bequests, the residue of the estate is left in two parts each to Birkenhead Borough Hospital; Birkenhead and Wirral Children's Hospital; Liverpool Open Air Hospital for Children, Leasowe; Birkenhead and Wirral Society for the Prevention of Cruelty to Children; and the Shaftesbury Boys' Club, Birkenhead.—Mr. Hugh Mitchell, J.P., F.S.A., of Dundarach, Pitlochry, Perthshire, solicitor, left £5000 to the Irvine Memorial Nursing Home for Atholl, and £100 to Edinburgh Royal Infirmary.—Sir John Phillips, M.D., F.R.C.P., of St. John's Wood, London, N.W., and late of Talbot-square, Hyde Park, W., honorary physician to the Queen, and obstetric physician to King's College, London, left £1000 to King's College Hospital, to found and endow a bed in the obstetric ward in memory of his wife.—Alderman John Frater, of Alma Place, North Shields, left £2000 to Tynemouth Victoria Jubilee Infirmary, £1000 to Tynemouth Blind Welfare Society and the Northern Counties Library, North Shields, and £1000 in trust to pay the fees of not more than 12 married women's maternity cases in the Frater Maternity Home.—The London Lock Hospital has received £5928 13*s.* 10*d.* from the executor of the late Mr. J. H. J. Hornsby's bequest, and donations of £1150 from the residuary legatees of the late Miss Drake-Beer.—Mr. F. Stirling Newall, of Wylam-on-Tyne, has sent a cheque of £10,000 to Lord Armstrong, Chairman of the Royal Victoria Infirmary, Newcastle-on-Tyne, Appeal Fund.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 5th.—5 P.M., ORTHOPÆDICS. Cases will be shown by Mr. Laming Evans: Case of Madelung's Deformity. Mr. Alan Todd: Bilateral Coxitis after Measles; Radiograms of a Case of Köhler's Disease of the Second Metatarsal; Milroy's Disease. Mr. W. H. Ogilvie: Radiograms of a Case of Kienboch's Disease and Keilts Disease. Other cases will be shown. 8 P.M., PATHOLOGY. Laboratory Meeting at the Lister Institute, Chelsea Gardens, S.W.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Mr. C. J. S. Thompson will show a photograph of an unknown portrait of Ambroise Paré. Paper: Mr. H. W. Carson: The Iliac Passion. Members are invited to bring objects (books, prints, documents, instruments, medals, &c.) of historical interest for exhibition at the meetings of this Section. 8.30 P.M., WAR and SURGERY. Special Discussion on the Necessity for Early Diagnosis in the Treatment of Spinal Injuries. Openers: Group-Captain H. V. Wells (War), Sir Percy Sargent (Surgery). N.B.—There will be no meeting of the War Section on Feb. 11th.

THURSDAY.—8.15 P.M., TROPICAL DISEASES. Subject: Monkeys and Human Disease. Short Papers by Mr. R. I. Pocock: Zoological Relationships of Primates (Apes and Monkeys). Mr. R. Lovell: Bacterial Diseases. Mr. E. Hindle: Virus Diseases. Dr. J. G. Thomson: Protozoal Diseases. Mr. T. W. M. Cameron: Helminthic Diseases. Dr. V. B. Wigglesworth: Insect Diseases. Colonel A. E. Hamerton: Morbid Anatomy. A Discussion will follow. COMPARATIVE MEDICINE: Members of this Section are specially invited to attend this meeting.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.). Cases: Dr. C. Worster-Drought: Case of Syringomyelic Arthropathy of Both Wrists. Dr. Bernard Myers: Two Cases of Essential Thrombocytopenic Purpura Hæmorrhagica, Three Years after Splenectomy. Dr. Hugh S. Stannus: Case of Hysterical Gait Following Encephalitis. Dr. Norman Hill: Case of Severe Rickets. Dr. Terence East: Case of Multiple Lipomata. Dr. J. B. Alexander: Case of Pyrexia of Obscure Origin. Mr. Cecil P. G. Wakeley: Case of Mixed Tumour of the Palate; Two Cases of Bilateral Parotid Swellings; Case of Bone Graft for Osteomyelitis of the Tibia. Dr. L. S. T. Burrell: Case of Pulmonary Tuberculosis with Tuberculous Tongue. Other cases will be shown. 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Clinical Cases: Mr. A. Griffith: Charts of Fields of a Case of Pituitary Tumour Treated by X Rays. Other cases will be shown. Papers: Mr. R. Foster Moore and Mr. Scott: Clinical and Pathological Report of Bilateral Glioma Retinæ. Mr. R. Foster Moore: Cirsoid Aneurysm of the Visual Cortex. Mr. Basil Graves: Scleral Illumination.

ROYAL INSTITUTION, Albemarle-street, W.

WEDNESDAY, Feb. 6th.—5.15 P.M., Prof. J. S. Huxley: Evolution and the Problem of Species.

THURSDAY.—5.15 P.M., Sir William Bragg: The Early History of X Rays.

BIOCHEMICAL SOCIETY.

MONDAY, Feb. 4th.—5 P.M. (Demonstrations at 3.30 P.M.), in the Lister Institute, Chelsea Bridge-road, S.W. Communications: H. Chick and M. H. Roscoe: (*a*) Methods for the Assay of Vitamins B_1 and B_2; (*b*) On the Separation of Vitamins B_1 and B_2 from Yeast. M. H. Roscoe: Rats Reared Eight Months After Weaning on Diets Deprived of B Vitamins. T. Lumsden (introduced by C. J. Martin): The Effect of Various Reagents upon Cells Cultured in vitro. L. F. Hewitt: Hormones of the Anterior Pituitary Lobe. N. F. Maclagan (introduced by E. C. Dodds): The Use of Decinormal Hydrochloric Acid for Standardising Electrometric pH Measurements. E. Boyland: The Sequence of the Formation of Phosphoric Esters and Carbon Dioxide in Fermentation by Dried Yeast. R. Robison and E. King: Hexosemonophosphoric Ester. E. King and W. T. J. Morgan: Methylated Derivatives of Hexosemonophosphoric Ester. W. T. J. Morgan: The Constitution of Hexosediphosphoric Ester. Demonstrations: G. H. Eagles (introduced by J. C. G. Ledingham): Growth of Vaccine Virus in Tissue Culture. A. Felix (introduced by J. C. G. Ledingham): Floccular and Granular Agglutination Phenomena. T. Lumsden and A. C. Kohn-Speyer (introduced by C. J. Martin): Serum as a Culture Medium for Serological and other Tests. E. M. Hume, N. S. Lucas, and H. Henderson Smith: Three Common Marmosets (*Hapale jacchus* Linn.) Bred in Captivity with the Aid of Ultra-violet Irradiation.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn, W.C. (Hunterian Lectures.)

MONDAY, Feb. 4th.—5 P.M., Prof. R. J. McN. Love.

WEDNESDAY.—5 P.M., Prof. C. P. G. Wakeley.

FRIDAY.—5 P.M., Prof. R. T. Payne.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 4th, to SATURDAY, Feb. 9th.—MEDICAL SOCIETY, 11, Chandos-street, Cavendish-square, W. Lecture by Sir Henry Simson on Some Obstetric Pitfalls, on Mon., at 5 P.M.—QUEEN MARY'S HOSPITAL, Stratford, E. Demonstration in General Surgery by Mr. A. E. Mortimer Woolf, on Mon., at 2 P.M.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Demonstration on Rheumatism and the Cardiac Child by Dr. Gerald Slot, on Tues., at 2 P.M.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Demonstration on Tumours of the Thyroid Gland and Their Treatment by Mr. A. E. Mortimer Woolf, on Wed., at 4 P.M. The above are free.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Feb. 4th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY, Feb. 1st.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Feb. 4th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Williamson Noble: Optic Atrophy.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Reflex Epilepsy.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Complications of Disease of the Cranial Air Sinuses.

FRIDAY.—12 noon. Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educational Methods.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Feb. 8th.—4 P.M., Mr. J. D. McLaggan: The Treatment of Chronic Suppurative Middle Ear.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 7th.—4 P.M., Mr. Pitts: Dental Sepsis.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Feb. 5th.—5 P.M., Dr. S. E. Dore: Alopecia.
THURSDAY.—5 P.M., Dr. A. M. H. Gray: Xanthoma, Herpes.

UNIVERSITY COLLEGE, London.
TUESDAY, Feb. 5th.—5.30 P.M., Miss Julia Bell (Galton Research Fellow): The Handicapping of Men by Diseases Transmitted by, but not Developing in, Women.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE, Manchester.
FRIDAY, Feb. 8th.—4.30 P.M. (at the Whitworth-street West Branch), Dr. Bride: Toxæmias of Pregnancy.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Feb. 8th.—3.30 P.M., Dr. Nash: Clinical Cases.

Appointments.

ABEL, A. LAWRENCE, M.S. Lond., F.R.C.S. Eng., has been appointed Assistant Surgeon to the Cancer Hospital.
CROWDEN, G. P., M.Sc., L.R.C.P. Lond., M.R.C.S., Lecturer in Applied Physiology in the Division of Public Health at the London School of Hygiene and Tropical Medicine.
STOCK, STUART V., M.B., B.S. Lond., M.B., B.Ch. Bristol, Honorary Anæsthetist, Bristol Royal Infirmary.
STOESSIGER, HILDA N., M.D. Lond., M.R.C.P. Lond., Assistant Physician, Princess Louise Kensington Hospital for Children.
TIBBLES, SYDNEY, L.R.C.P., L.R.C.S. Edin., F.R.F.P.S. Glasg., Honorary Oculist to the Musicians' Benevolent Fund.
WILKIE, J., M.B., Ch.B. Glasg., D.P.H., Resident Medical Officer of the Hull Infectious Diseases Hospitals.
Westminster Hospital: MORGAN, T. W., L.R.C.P. Lond., M.R.C.S., Senior Resident and Casualty Officer; WALLER, R. S. L., L.R.C.P. Lond., M.R.C.S., and MINDLINE, J., L.R.C.P. Lond., M.R.C.S., Resident House Physicians; LLOYD, O. P., L.R.C.P. Lond., M.R.C.S., and MACHRAY, R., L.R.C.P. Lond., M.R.C.S., Resident House Surgeons; and WILLIAMS, A. W., L.R.C.P. Lond., M.R.C.S., Obstetric Assistant and House Physician to the Children's Department.
Certifying Surgeons under the Factory and Workshop Acts: MAGUIRE, W. H., M.B., B.Ch. Dub. (Roade District of the County of Northampton); and GELL, G. C., L.R.C.P. Lond., M.R.C.S. (Staveley District of the County of Derby).

Vacancies.

For further information refer to the advertisement columns.

Birmingham Royal Cripples Hospital.—Sen. H.S. £400.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.
Bootle Borough Hospital, Derby-road.—Sen. M.O. Also Two Jun. M.O.s. At rate of £150 and £125 respectively.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. At rate of £100.
Bristol, Brentry Certified Institution, Westbury-on-Trym.—Res. Med. Supt. £650.
Cancer Hospital, Fulham-road.—Director of Electrical and Radio-Therapeutic Dept.
Carlisle City.—School Dentist. £500.
Charing Cross Hospital, W.C.—Hon. Clin. Asst. in X Ray Dept.
Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. At rate of £150.
Dreadnought Hospital, Greenwich.—Physician to Out-patients.
Durham County Council, Education Department.—Asst. School M.O. £600.
East Ham Memorial Hospital, Shrewsbury-road, E.—Hon. Asst. Physician.
Folkestone Borough.—M.O.H. £900.
Glasgow Royal Cancer Hospital.—Medical Officer. £600.
Gloucester County Mental Hospital.—Jun. Asst. M.O. £350.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. in the Dept. of Pathology. £350.
Hospital for Sick Children, Gt. Ormond-street, W.C.—Cas. O. £400. Also Asthma Research Scholar. £300.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Asst. Surgeon.
Ilford Emergency Hospital.—Jun. H.S. £100.
Ipswich County Borough.—Asst. M.O.H., &c. £600.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150. Also two H.S.'s. Each at rate of £120.
Jersey Mental Hospital.—Med. Supt. £650.
Lucknow University.—Professorship of Medicine and Physician to King George's Hospital. Rs.1200–50–1400 p.m.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. Also H.S. to Ear, Nose and Throat Dept. Each at rate of £200.
Manchester, Ancoats Hospital.—H.P. At rate of £100.
Manchester Hospital for Consumption, &c.—Hon. Asst. Phys.
Manchester Royal Eye Hospital.—Two Jun. H.S.'s. Each £120.
Manchester, Royal Infirmary.—Anæsthetist. At rate of £50.
Melbourne University, Victoria, Australia.—Chair of Obstetrics. £2000.
Middlesex Hospital Medical School, W.—Radium Registrar. £300.
Park Royal Hospital, Acton-lane, Willesden.—Res. First Asst. M.O. £430.
Preston Union.—Jun. Res. M.O. At rate of £104.
Royal Free Hospital, Gray's Inn-road, W.C.—Eastman Dental Clinic Director.
Smethwick County Borough.—Sen. Asst. M.O.H. £550.
Southern Rhodesia Government, Public Health Department.—Medical Inspector of Schools. £800.
St. Andrew's Hospital, Dollis Hill, N.W.—Asst. Surgeon.
Stafford, County Mental Hospital.—Second Asst. M.O. £600.
Sutton, Surrey, Downs Hospital for Children.—Jun. Asst. M.O. £500.
Swansea County Borough Infectious Diseases Hospital.—Res. M.O. £350.
Swansea Hospital.—H.S. £150.
Warwick County Mental Hospital, Hatton.—Jun. Asst. M.O. £350.
Watford, Herts, Peace Memorial Hospital.—Res. M.O. At rate of £150.
Warwickshire County Council.—Asst. County M.O.H. £600.
West Bromwich and District General Hospital.—H.S., H.P. Also Cas. H.S. Each at rate of £200.
West London Hospital, Hammersmith-road, W.—Hon. Obstetric Registrar.
Willesden General Hospital, Harlesden-road, N.W.—Hon. Ophthalmic Surgeon.
Wolverhampton, Royal Hospital.—Res. M.O.
Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.—Hon. Sen. Dental Surg., Hon. Dental Surg. Also Asst. Phys. to the Radiological Dept. £50.
York, The Retreat.—Jun. M.O. £300.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Higham Ferrers (Northants), Barrow (Lancs.), Bucksburn (Aberdeenshire), Harrold (Beds.)

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for Banff County (Sheriffdom of Aberdeen, Kincardine, and Banff). Applications should reach the Private Secretary, Scottish Office, Whitehall, London, S.W., not later than Feb. 16th.

Births, Marriages, and Deaths.

BIRTHS.

PARKINSON.—On Jan. 26th, at Devonshire-place, W., the wife of Dr. John Parkinson, of a daughter.

DEATHS.

ADDENBROOKE.—On Jan. 22nd, at Consterdyne, Kidderminster, Bertram Addenbrooke, M.D., aged 54 years.
BARKER.—On Jan. 22nd, at Wandsworth Bridge-road, S.W., William James Townsend Barker, L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., D.P.H., aged 68 years.
BULTEEL.—On Jan. 17th, Samuel Bellenden James Bulteel, M.B., C.M. Edin., of Beverley, Cary-avenue, Babbacombe, S. Devon.
GREENWOOD.—On Jan. 23rd, at Hemingford Abbots, Hunts, Arthur Greenwood, M.R.C.S., L.R.C.P. (late of Highgate), aged 77 years.
JAMES.—On Jan. 22nd, at his residence, De Cham-road, St. Leonards-on-Sea, Major Henry Daniel James, R.A.M.C. (retired), aged 71 years.
JONES.—Watkin Williams Jones, 9, Kempshott-road, Streatham Common, S.W.16, M.D. Brux., 1876; F.R.F.P.S. Glas., 1876; L.S.A. Lond., 1869 (Char. Cross); late Hon. Phys. C.E.T.S. Home for Inebriates, Whatlington; Surg. J.P. and Coroner, Colon, Serv.: Surg. and Insp. P. & O.S.N. Co. Sub. Editor of THE LANCET, 1870-76.
MCDERMOTT.—On Jan. 22nd, at Lypiatt-terrace, Cheltenham, Lieut.-Colonel Thomas McDermott, O.B.E., R.A.M.C. (retired).
PERRY.—On Jan. 21st, Edward Verdon Perry, O.B.E., M.R.C.S., of Reepham, Norfolk, in his 77th year.
TIGHE.—On Jan. 21st, at Stannington, Northumberland, Lieut.-Colonel John Valerian George Brosnan Tighe, M.B., Superintendent of Gateshead Mental Hospital.
WIGGLESWORTH.—On Jan. 23rd, at Oak-road, Withington, of pneumonia, after a very short illness, Winefred Furnival Wigglesworth, M.B., D.P.H.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. II., 1928.

THE Index and Title-page to Vol. II., 1928, which was completed with the issue of Dec. 29th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

MEDICINAL WATERS OF SOUTH AFRICA.

UNDER the auspices of the International Society of Medical Hydrology, a small meeting of hydrologists and chemists took place on Jan. 24th, when Mr. M. Rindl, professor of chemistry at Grey University College, Bloemfontein, gave an account of the chemistry of certain South African waters. The High Commissioners for South Africa and New Zealand were represented at the meeting. Prof. Rindl stated that he had been drawn to the subject in the search for home supplies of potash, and though his survey of the springs had failed to provide any results in that direction, he had made and published a preliminary survey, in the hope of arousing medical and other interest in this important national asset. He found that the analyses of the waters were often incomplete and out of date, that insufficient clinical data were forthcoming, and that bathing facilities were inadequate. Many of the springs had a long history of use, first by the aborigines, and then by the farmer-settlers, some still being used only in the most primitive way. Yet the waters themselves were well worthy of study and development. They were principally either sulphurous or chalybeate, no important brine springs being known, in spite of the extent of the surface "salt-pans." Seven of the springs had temperatures exceeding 105° F., the hottest being 158° F. Many were said to be radio-active, and one had a fair proportion of helium. In the discussion that followed, Dr. Arthur Herbert spoke of his experience in the development of the spas of New Zealand, under the Government Department of Tourist and Health Resorts. Government action was essential in new and sparsely populated countries. Where abundant thermal waters were present in a good climate, it was a mistake, he said, to build elaborate baths. What was needed was to concentrate on accommodation for patients, and the provision of medical attention and auxiliary treatment. Dr. A. Cawadias emphasised the supreme necessity of obtaining clinical data before full development could take place. Other speakers included Dr. Fortescue Fox, Dr. E. P. Poulton, Mr. Judd Lewis, and Dr. Brittan Gill.

SANDOW'S SYMMETRION ROLLER.

Sandow's Symmetrion Roller is a mechanical appliance for the application of self-massage which can be used easily over any area of the body where such treatment is required. It consists of five rollers of a soft spongy material arranged on a central axis with handles at either end, the length of the apparatus being just short of 2 feet. From the handles there run elastic cords, playing through pulleys which themselves are hooked on to a bent rod for fixation to any hook or staple placed at the appropriate height. The rollers give a yielding pressure and will adapt themselves accurately to inequalities of surface on the part being massaged, while the elastic tension of the cords permit of the necessary pressure being applied and regulated while the body is in a state of muscular relaxation. The movements can be carried out either when the patient is in an upright position or reclining, and the more there is relaxation during massage the more beneficial will be the results. Probably self-massage can be recommended more suitably as a treatment for constipation than for any other common condition, while as a substitute for or adjunct to regular exercise there is no doubt of its general value.

Sandow's Symmetrion Roller may be obtained from the Standard Health Appliance Co., Ltd., 7, Percy-street, W.1.

POPULAR BIOLOGY.

TWO volumes [1] of the "Science for You" series, recently published, contain together 35 longer and shorter essays on a variety of biological topics and are a sufficient answer to the complaint which is sometimes made that scientific people who find out things cannot explain their results to the lay public. Dr. Yonge's 14 chapters on marine fisheries are wonderfully interesting and just what are wanted, but he swallows too easily the idea that the disappearance of plague from England and Europe at the end of the seventeenth century was due to the replacement of *Mus rattus* by *M. decumanus*. Prof. Fox explains some of the recent work about respiratory pigments and Tyrian purple, writes of youth and age, the meaning of play, and the homing instinct, and gives an account of his own interesting study of the influence of the Suez Canal in allowing the animals of the Red Sea and Mediterranean to mix. This

[1] Queer Fish; Essays on Marine Science and other Aspects of Biology. By C. M. Yonge. Pp. 193. Blue Blood in Animals and other Essays in Biology. By H. Munro Fox. Pp. 205. London: George Routledge and Sons. 1928. 5s. each.

(*Continued at foot of next column.*)

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 216.*)

THE following is the text of the official bulletins which have been issued during the past week:—

FRIDAY, JAN. 25TH. 11.15 A.M.

The improvement in His Majesty's condition noted in the last bulletin continues. Bacteriological examination shows that the right chest is now free of the infecting organism. (Signed by Sir Hugh Rigby, Dr. L. Whitby, and Lord Dawson.)

SATURDAY, JAN. 26TH. 8.15 P.M.

His Majesty the King continues to make slow progress. (Signed by Lord Dawson.)

WEDNESDAY, JAN. 30TH.

The King continues to gain strength slowly, and His Majesty's progress is satisfactory. (Signed by Sir Hugh Rigby and Lord Dawson.)

(*Continued from previous column.*)

last article would be much better for a map and, indeed, a few good illustrations would improve many of the essays; they are perhaps impossible at the price. Both volumes have an article on the determination of sex; so has every other book on popular biology published in the last five years. The public must be growing very tired of it. One might say with the old Greek prose primer, "there ought to have been a law against love, so that all this trouble might not have been wasted."

ERYTHEMA NODOSUM.

IN the Long Fox Memorial Lecture delivered in the University of Bristol last year, and now published, Dr. J. Odery Symes takes as his subject the relationship between erythema nodosum and tuberculosis. He critically reviews the enormous continental literature, brings forward some weighty personal experience and some important case reports, and concludes that the association between the two diseases is beyond dispute. "Erythema nodosum," he says, "must always be regarded as a danger signal, as a timely warning that tuberculosis may exist or may develop. . . . While it is possible that tuberculosis prepares the soil for erythema nodosum, it seems more likely that erythema nodosum prepares the soil for tuberculosis; or if centres of latent disease exist in the bronchial glands or elsewhere, it lights them up to renewed and often fatal activity. The danger of this tuberculous infection is greatest during the first six months following the appearance of the rash."

NEW PREPARATIONS.

Diathermy Contact Soap.—Messrs. Rouse and Sons, Ltd., 50, Mortimer-street, London, W., have placed on the market a soap for use by those employing diathermy in their practice and who have experienced difficulty in the application of the electrodes. It has been found that the brine solution in which the felt-covered electrodes in ordinary use are saturated evaporates with the heat incidental to diathermy, when burning may occur, a trouble which it has been recognised can be obviated to a large extent by the use of any shaving soap. But even so an irritating action may be set up, while it is claimed that with this preparation a perfectly smooth contact can be made, the troublesome air bubbles not appearing. In appearance the soap resembles cold cream, and is smooth and easily handled.

Iodurum (Messrs. R. Demuth, 68, Salusbury-road, and Montrose-avenue, London, N.W.).—We have before now commented favourably upon various useful and elegant pharmaceutical preparations which have reached us from R. Demuth's laboratories, and the new preparation possesses both these qualities. The value of iodine as a universal antiseptic, especially as a first-aid adjunct, is now recognised in every household, so that anything leading to convenience of application should have a wide appeal. Iodurum is a solidified alcoholic solution of iodine, enabling the therapeutic properties of tincture of iodine to be employed in undiminished form in a clean and prompt manner. The nuisance of spilt iodine and the trouble of applying the tincture as a paint are matters of wide experience, so that a method of employment in which neither trouble can occur will be appreciated. Iodurum, an iodine stick, is supplied in a small glass tube enclosed in a metal case, and if the stick after use is replaced immediately in the tube, the tube corked, and the metal case carefully closed, the preparation will remain efficacious.

Hunterian Lecture

ON

LOCAL ANÆSTHESIA IN UPPER ABDOMINAL SURGERY.

Delivered on Feb. 1st, 1929, before the Royal College of Surgeons of England

By CHARLES A. PANNETT, M.D., B.Sc. Lond.,

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So magnificent was the boon conferred upon humanity by the discovery of general anæsthesia, so welcome the merciful oblivion to the patient and the untrammelling quietude of his body to the surgeon, so perfect and without danger have its methods become that it has been long accepted in England unchallenged as an almost ideal method for upper abdominal surgery. Yet, the operation completed, the aftermath is not invariably so satisfactory. There is an uncertainty about future events which is directly attributed to the inhalation of the anæsthetic. Damage to the parenchyma of the liver and kidneys, irritation of the lung endothelium, diminished oxygen-carrying capacity of the red blood corpuscles, the exhaustion from uncontrollable vomiting, the shock which comes on when the stimulation of the ether vapour is withdrawn, all tend to lessen the potential capacity for recovery of the patient, who must also run the risk of the inhalation of mucus and vomit during the unconscious period immediately succeeding the operation. It would be wrong to exaggerate these ill-effects of general anæsthesia, but it must be admitted by any impartial observer that the state of a man who has passed through an upper abdominal operation under local anæsthesia is very much better during the early post-operative period than that of him who has submitted to a general anæsthesia. This point need not be laboured. It is a simple demonstrable truth. Let us then turn to contemporarily available methods of local anæsthesia. They are: (1) local infiltration; (2) paravertebral anæsthesia; (3) splanchnic combined with anterior abdominal anæsthesia; and (4) spinal anæsthesia.

Successive local infiltration of structures before they are divided is not effective in abdominal operating so the choice lies between paravertebral, splanchnic, and spinal methods. They are all methods of conduction anæsthesia—that is, they attempt to abolish sensation over wide areas by interrupting nerve trunks. The difficulty is that the nerve-supply of the abdomen and its contents nowhere is limited in its path to a narrow area, such as prevails in the neck or upper limb. If a block of the nerves concerned is to be brought about outside the vertebral column, at least nine nerves on either side must be anæsthetised. This requires great skill on the part of the surgeon, occupies considerable time, and is a serious ordeal for the patient. I have devoted much time and labour in the attempt to perfect a reliable technique for paravertebral anæsthesia, but I have been driven to discard it as a practical solution of the problem. When it succeeds the anæsthesia is perfect, but if one nerve-root only eludes the needle the patient will retain pain sensation in some region of the operation area.

Splanchnic Anæsthesia.

Splanchnic anæsthesia, with which must be combined some method of anæsthetising the anterior abdominal wall, has been employed very widely abroad and quite extensively in this country. The splanchnic nerves pass through a comparatively narrow area where they traverse the diaphragm, and their block here abolishes sensation in the upper abdomen. An approach either from behind or, after opening the abdomen, from the front may be made. The posterior approach of Kappis has been used by some surgeons in this country, but always apparently in association with general anæsthesia, so that it is very difficult to say how successful it is. In one continental clinic where general anæsthesia is not added as routine it was stated that anæsthesia was successful in only 50 per cent. of cases. On the other hand, the anæsthetic fluid can be accurately placed where it is needed by the anterior route and the procedure is associated with less risk than the posterior method. Nevertheless, if no general anæsthesia is employed the technique of injection from the front is in itself painful and not always possible in the conscious patient. Though excellent anæsthesia by anterior abdominal block and anterior splanchnic block can be obtained, the method is not very well adapted to English patients, though circumstances may render it desirable, and a little general anæsthesia to allow of the splanchnic injection itself may make it possible.

I believe it better to avoid the administration of a general anæsthetic continuously throughout an operation under splanchnic anæsthesia, for I have received the impression that the post-operative course is no better than with pure general anæsthesia and lung complications seem to be quite as common. Splanchnic anæsthesia carried out as above is a valuable method which should be at the command of every surgeon. I have found it useful to modify Braun's original technique slightly. The vertebral column between the aorta and inferior vena cava is felt just above the pancreas with the pulp of the left index finger through the lesser omentum. The finger is kept close to the right side of the aorta, and the narrow tubular guide of the long fine needle is passed along its dorsum down to the vertebra and kept there by the middle finger. The needle is then passed down the guide as far as the bone, aspiration performed to prove the points of the needle not to be in a blood-vessel, and 30 c.cm. of 1 per cent. novocaine solution containing 20 drops of 1 in 1000 adrenalin per 100 c.cm. injected. Almost immediately the viscera fall back into the abdomen and render it quite easy to inject a further 10 c.cm. of the solution just to the left of the aorta behind the œsophagus. This injection is necessary to reach the left cœliac ganglion, for I have found, by trial with dyes in the dead body, that fluid injected only at the one point recommended by Braun sometimes fails to reach the left splanchnic nerves (Fig. 1).

Spinal Anæsthesia.

Leaving this method of anæsthesia, let us turn to the possibilities of spinal block, conduction anæsthesia carried as far back as is possible. Years ago spinal anæsthesia was used to a considerable extent, and Barker was able to show how high anæsthesia could be obtained by rendering the fluid used heavy enough to be able to control its position by altering that of the patient. But high anæsthesia by the technique then employed was found to be too dangerous and was given up so that, generally speaking, at the present time the spinal method is held to be suitable only for operations upon the lower part of the body. I hope to prove to you, however, that such high operations can be performed with safety and that there is a large field of usefulness for this anæsthetic method.

The problem in its simplest form is to bring an anæsthetic solution of sufficient strength in contact with the nerve-roots supplying the abdominal wall and the contained viscera—that is, roughly speaking, for upper abdominal work the roots of the sixth dorsal to the third lumbar nerves. The difficulty has always been to make a drug injected below the termination of the spinal cord diffuse up high enough to reach the fifth or sixth dorsal segment. There is one obvious and easy solution—namely, to inject the drug at that point of the spinal column where it is wanted. This practice has been indeed followed by a number of surgeons, but it is dangerous because of possible puncture of the cord and the production of a hæmatomyelia. The risk is one which should not be taken

where there is general anæsthesia as the safe alternative. For spinal anæsthesia puncture should always take place below the level of the lowest extremity of the spinal cord. It should not be higher than the interval between the second and third lumbar spines.

The Movement of Fluid in the Subarachnoid Space.

The question of the movement and final disposition of fluid injected is obviously intimately bound up with the natural flow of cerebro-spinal fluid about which we have not altogether precise knowledge. It seems to be well established that the fluid is secreted by the choroid plexuses of the lateral ventricles, flows through the foramina of Monro into the third ventricle, and thence by the aqueduct of Sylvius into the fourth ventricle. The foramina of Magendie and Luschka lead it into the subarachnoid space. The path of the fluid thence is not so clear. I quote from L. H. Weed [1]:—

"From cisternal dilatations of the subarachnoid space in the region of the cerebello-bulbar angle the cerebro-spinal fluid slowly seeps downwards in the spinal subarachnoid space, but passes more rapidly upward about the base of the brain and thence more slowly over the hemispheres. . . . In the spinal region there is also an almost equivalent passage of fluid upward."

H. Jackson [2] says that the fluid passes downwards along the posterior surface of the cord and upwards on the anterior aspect. A. Levinson [3] makes the same statement. Experimental demonstration of this fact, however, is far from conclusive, and I venture to affirm that no such circulation in the spinal canal does in reality take place. Wade himself injected into the lumbar region of the spinal canal potassium ferrocyanide and iron ammonium citrate in isotonic solution, and by acid fixation methods was able subsequently to find granules of Prussian blue in the whole spinal and basilar portions of the subarachnoid space which were "rapidly filled," whilst "the cerebral portion of the space was not completely injected until the experiment had been continued for several hours." But he injected the solution at a pressure of 130–180 mm. water, whilst the pressure of cerebro-spinal fluid in dogs is very constant and averages 112 mm. water, whilst that in cats averages 119 mm. water. It seems clear to me that he displaced the fluid in the spinal canal up into the cranial cavity until the venous pressure equalled the pressure of injection. His results could be explained in this way. In rabbits I performed the experiment (and repeated it) of injecting a few drops of a concentrated solution of methylene-blue under the arachnoid of the lumbar region of the cord after laminectomy, the animals being under the influence of urethane. After 45 minutes the animals were killed and the dye was found to have diffused only a few millimetres. There was no evidence at all of an active and vigorous circulation. It may be objected that in man after head injuries and sometimes after laminectomy large volumes of fluid escape in 24 hours. This large secretion may, however, very likely be an attempt to restore the cerebro-spinal pressure which is kept low by the leak in the dural sac, to its normal level, and therefore may have no bearing on the problem. If, as I believe, the absorption of normal fluid from the canal is only slight, necessitating little in the way of replacement, an anæsthetic injected into the dural sac would spread very slowly if it were dependent upon the physical process of diffusion alone. This is in agreement with the fact that 3 c.cm. of a 5 per cent. novocaine solution which is isotonic with cerebro-spinal fluid, injected between the third and fourth lumbar vertebræ, anæsthetises only that part of the body whose nerves pass downwards in the cauda equina.

An anæsthetic solution may be made to spread upwards above its point of introduction into the spinal canal (1) by altering the pressure conditions within the spinal canal before injecting; (2) by removing so much fluid and replacing it by an equal volume of anæsthetic solution; or (3) by making it either lighter or heavier than the cerebro-spinal fluid and altering the position of the patient.

FIG. 1.

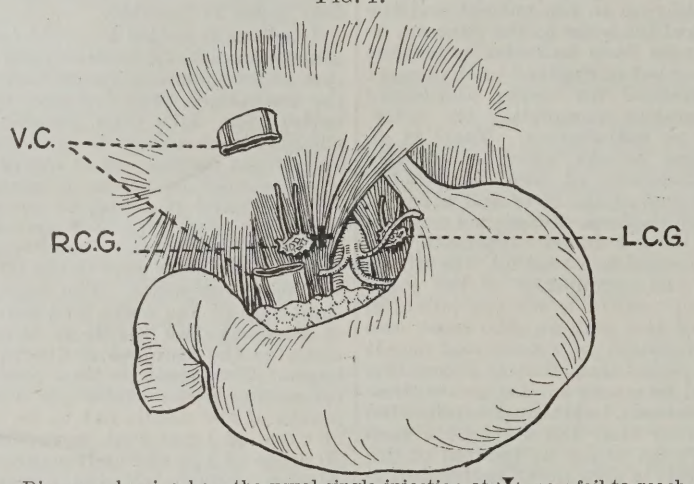


Diagram showing how the usual single injection at ✠ may fail to reach the left splanchnic nerves.

V.C. = Vena cava. R.C.G. and L.C.G. = Right and left cœliac ganglia, with the splanchnic nerves passing into them.

1. *The Reduction of Cerebro-spinal Pressure before Injection.*

This method was originally introduced by Le Filliâtre.[4] By removing definite volumes of cerebro-spinal fluid he was enabled to make the anæsthesia rise to any desired level and even to become general. The principle of the method is simple. The dural sac being enclosed in a rigid bony cavity, when fluid is withdrawn the space evacuated must be filled by increase of blood in the vessels in the intra- and extra-dural spaces. The veins in fact become engorged, and the intradural pressure is diminished to one-half if 30 c.cm. be withdrawn.[5] Weed showed that there is a great tendency to keep the pressure of the cerebro-spinal fluid constant hence, if after withdrawal a smaller quantity of anæsthetic solution be injected this will be more or less sucked along the subarachnoid space or at least it will be easily forced along it by pressure upon the piston of the syringe. Le Filliâtre uses a 2 per cent. cocaine hydrochloride solution as he says novocaine does not diffuse so well, takes away 25–30 c.cm. fluid, and injects 2·5–3·0 c.cm. of the solution. He injects forcibly and so must use a needle of large bore and practises "barbotage"—i.e., he injects and sucks out and injects again several times. The smaller amount will give anæsthesia up to the mammary line, the larger amount will cause generalised anæsthesia. He reports 9947 cases with two deaths, neither of which appeared to him to be due to the method. He says that if no more than 0·05 g. be injected no harm will result; 4 per cent. of his operations have been upon the head, 8 per cent. on the thorax, and 43 per cent. on the abdomen. No complications beyond two cases of severe headache and 4 per cent. of slight headache have occurred. Other surgeons have tried this method and met with accidents, but amongst his adherents are Masini, of Marseilles, and P. Delmas.[7]

[1] Physiological Reviews, 1922, ii., 171.
[2] Jour. Amer. Med. Assoc., 1922, lxxix., 1394.
[3] The Cerebro-spinal Fluid, 1923.
[4] Paris Chirurgical, 1923, xv., 95; Jour. de Méd. de Paris, 1920, xxxix., 317; La Presse médicale, 1928, xxxvi., 1320.
[5] R. Bloch: Presse médicale, 1921, xxix., 316.
[6] La Presse médicale, 1928, xxxvi., 1321.
[7] Ibid., 1918, xxvi., 137.

Delmas, V. Riche,[8] and Bloch have used Le illiâtre's method with success, the anæsthetic agent eing novocaine. It would seem to be worthy of rther study, the chief objections to it being the use f a large bore needle which leaves a leaking hole in ıe dura and the necessity for extracting rather a rge quantity of cerebro-spinal fluid.

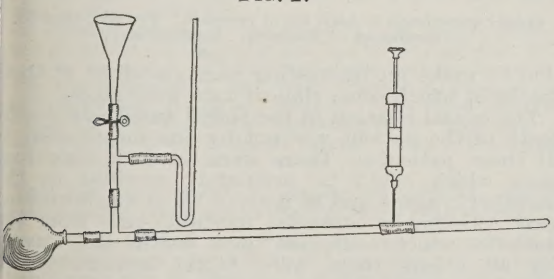
2. *The Replacement of Cerebro-spinal Fluid with Anæsthetic Solution.*

By dissecting out the cord in its membranes in an verage-sized man I found that when distended the ural sac up to the level of the sixth cervical vertebra ould hold 30 c.cm. of fluid. By an estimate which ust necessarily be rather inexact let us suppose the ac up to the level of the fifth dorsal segment to ontain 20 c.cm. of fluid, it might be possible to xtract this volume and replace it by a solution hich would then bathe the whole of cord which it is esired to anæsthetise. With this intent I aspirated 0 c.cm. of cerebro-spinal fluid from a patient with arcinoma of the œsophagus. The patient was then laced with the head low and 20 c.cm. of 0·5 per cent. ovocaine solution (0·10 g. novocaine) which is much ghter than cerebro-spinal fluid, injected. The result as that sensation was delayed and dulled up to the avicles but anæsthesia was not deep enough to llow the operation to take place. In another xperiment 15 c.cm. of fluid were withdrawn and 2 c.cm. of 1 per cent. novocaine injected. The esult was very similar. The strength of the novo- aine was apparently not sufficient to soak into the ervous tissue. I have not had the opportunity to y the effect of using a 1·5 per cent. solution; this ould mean using rather a large dose, but if the head ere kept low the solution would in all probability emain round the lower half of the cord, for the pecific gravity of it is only 1·0028 compared with ·006 of the cerebro-spinal fluid. This method is orthy of further study.

3. *Use of a Heavy or Light Anæsthetic Solution.*

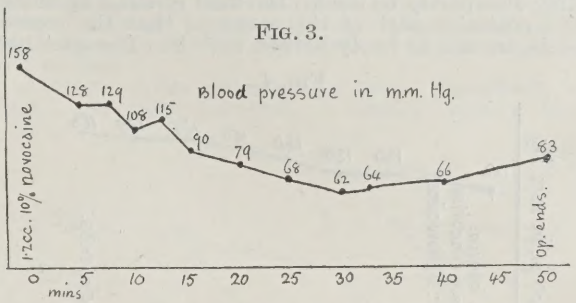
A solution much lighter than cerebro-spinal fluid ill rise to the highest point of the spinal canal and heavy fluid sink to the lowest level. The very areful work of A. E. Barker [9] in 1907 showed how a

FIG. 2.



eavy solution can be made to settle at the desired oint in the spinal canal. Barker's heavy solution ontaining stovaine and glucose is still used but not ften for high anæsthesia as Barker recommended. his is partly because stovaine is somewhat toxic nd many operators have therefore given up its use. ovocaine, being considerably less toxic, is a prefer- ble agent. A 10 per cent. solution has a specific ravity of 1·017. Tinged with a dye I have watched s behaviour when injected into the apparatus seen n the neighbouring sketch (Fig. 2). The glass tube epresents the spinal canal and holds approximately he same volume as that. The balloon at the end epresents the fluid in the cranial cavity; the pressure n the system can be varied by raising and lowering he funnel and is measured by the manometer; the oloured anæsthetic solution is injected by piercing he rubber connexion with the hypodermic needle of he syringe containing it. When the system was lled with a saline solution of the same specific gravity as cerebro-spinal fluid (1·006) and 1 c.cm. of coloured 10 per cent. novocaine injected with the tube sloped at an angle of 20 degrees with the horizontal, it was found that the anæsthetic solution settled down in a layer in the lower half of the tube and showed very little tendency to mix with saline solution. With this declivity it trickled down a distance equal to that between the third lumbar and fifth dorsal vertebræ (28 cm.) in 3¼–5 minutes. Alteration of the general pressure in the system by withdrawing fluid first did not seem to alter the rate of flow or tendency to diffusion in the least. These results cannot be applied without reserve to the

FIG. 3.



Typical fall of blood pressure in spinal anæsthesia. Male, aged 68. Carcinoma cæci. Ileo-transverse colostomy.

living body as the space between the cord and inner surface of the arachnoid is broken up by the anterior and posterior nerve-roots, the ligamenta denticulata, and a few other strands of arachnoid. These must obviously cause some obstruction to the flow of the anæsthetic fluid. It is essential to obtain anæsthesia that the novocaine solution should flow upwards behind the spinal cord in order to affect the posterior nerve-roots. When the amount of cerebro-spinal fluid is small and its pressure lower than normal, the head-down position may make so much of it flow out from the spinal canal into the cranial cavity that the cord may come to lie almost in contact with the membranes behind. Under such circumstances the solution deposited in the dural sac below the level of the cord may find it easier to flow upwards along its anterior surface, so that it may miss contact with the posterior roots or make irregular contact and so lead to imperfect anæsthesia. Some such explanation may account for failure where a good puncture has been made and the technique carefully followed out; in fact it has been suggested to me by the fact that it has seemed that anæsthesia has come on more quickly and extensively when the pressure of the cerebro-spinal fluid has been high than when it has been low.

Mention must be made here of a method of anæsthesia using a light solution developed by G. P. Pitkin[10] in America. Alcohol is added to lower the specific gravity and gliadin solution (prepared from starch) to render the liquid slightly viscid and inhibit the rate of diffusion. This author has also used a heavy solution of novocaine for obstetrical work.[11]

CHOICE OF ANÆSTHETIC AGENT.

Novocaine, being the least toxic of known local anæsthetics, would seem to be the best drug to use, but the objections have been raised that it is less certain in its action than cocaine or stovaine whilst muscular relaxation is not so complete. Both these facts are true. Novocaine seems to act more powerfully upon sensory than motor nerves. This can be demonstrated clearly by dissecting out the two sciatic nerves in a decerebrate frog, and painting that on the left side with 2 per cent. novocaine solution. On stimulating the middle of the painted area a contraction of the left limb occurred but no reflex contraction of the right limb. That the reflex path was not blocked was shown by stimulating the unpainted right sciatic when movements of both the hind limbs

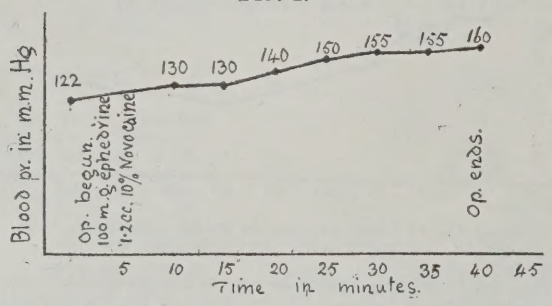
[8] Ibid., 1919, xxvii., 225. [9] Brit. Med. Jour., 1907, i., 665.

[10] Jour. of Med. Soc. of New Jersey, 1927.

[11] G. Pitkin and F. C. McCormack: Surg. Gyn. and Obstet., 1928, xlvii., 713.

occurred. Quite clearly, therefore, both excitability and conductivity of the motor fibres was retained in the painted nerve, whilst the sensory fibres were blocked. The muscular rigidity under novocaine spinal anæsthesia of which some surgeons complain is due to the fact that the anæsthesia did not extend high enough to block the splanchnic sensory supply. Under these circumstances pulling on the viscera will reflexly cause the abdominal musculature to contract. I have often demonstrated this, and I have observed several times whilst sewing up a laparotomy wound quite painlessly that the patient has been able to move his toes. This effect with a heavy solution may also partly be due to the fluid running up along the posterior part of the canal so that the motor roots are not so freely bathed with it. The question

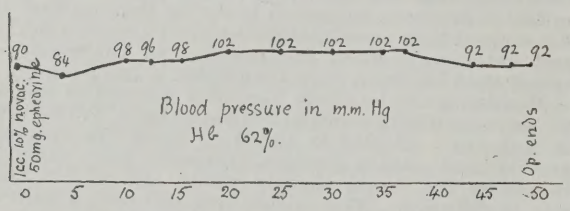
FIG. 4.



Effect of ephedrine on blood pressure in spinal anæsthesia. Carcinoma of stomach; exploration of abdomen.

arises whether adrenalin should be added to the novocaine or not. I rather feel with Barker that adrenalin, owing to the vascular spasm it produces, may do harm to the delicate nervous tissue, and there is some evidence to support this.[12] H. Hilarowiez and M. Szajna [13] assert that potassium chloride helps the penetration of novocaine and being a stimulant to nerve tissue lowers its toxicity. I have tried the addition of 1·1 per cent. KCl to the 10 per cent. novocaine, but have been unable to confirm their claims. Whether the viscosity of gliadin used by Pitkin lessens the rapidity of absorption of the novocaine into the veins and lymphatics, I do not know, but I believe it to be true that raising the blood pressure by the injection of ephedrine at the

FIG. 5.

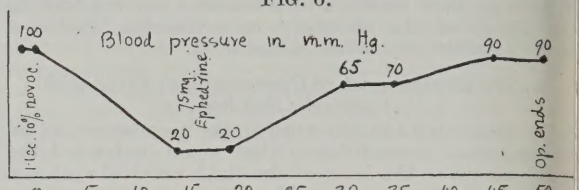


Spinal anæsthesia in low blood pressure. Effect of ephedrine. Blood pressure maintained. Male, aged 42. Duodenal ulcer. Gastro-jejunostomy.

same time as the spinal injection leads to rapid absorption of the drug and diminishes the anæsthetic effect. Further investigation of this point is clearly necessary.

I do not give morphine or scopolamine before the operation. The latter is a dangerous drug of uncertain action, but I have of late given sodium veronal the night before and the morning of the operation. Agda Hofvendahl [14] and A. L. Tatum and K. H. Collins [15] have brought forward evidence showing that in the rabbit, dog, and monkey the convulsions of acute cocaine poisoning can be cut short and the animals recover from an otherwise fatal dose if sodium veronal be injected intravenously. Veronal also seems to act prophylactically. Although deaths from spinal anæsthesia do not usually seem to be due to a direct toxic action it seems to be a harmless and further

FIG. 6.



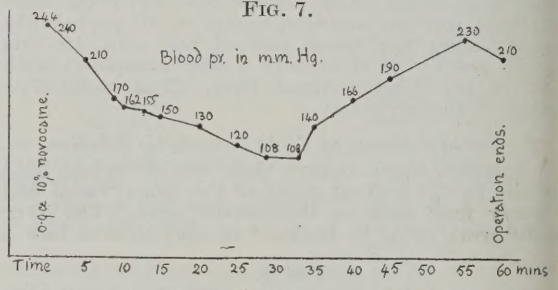
Great fall in blood pressure in spinal anæsthesia. Circulation well maintained in head-down position. Female, aged 30. Gall-stones; choledochostomy and cholecystostomy.

precaution to give preliminary sodium veronal medication.

DANGERS AND DISADVANTAGES OF SPINAL ANÆSTHESIA.

The crucial question of the risk of the anæsthetic must be faced and answered. If we restrict our investigations to death from novocaine spinal anæsthesia there are very few to be found in the literature, but it is likely that only a small percentage of such deaths are reported. As this applies equally to general anæsthesia, it is fair to compare the statistics of the two methods. The best collected series have been published by E. A. Rygh and D. H. Bessesen.[16] Amongst 250,895 administrations by 31 surgeons there were 75 deaths—i.e., 1 in 3345. They were

FIG. 7.



Spinal anæsthesia in high blood pressure. Female, aged 58. Carcinoma of stomach. Gastrectomy.

able to make an interesting analysis of 29 of these deaths of which some clinical data were given.

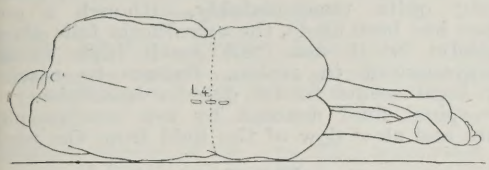
The causal relation of the spinal anæsthetic to the death of the patient was not by any means clear in all these patients. There were, in fact, only four cases which could be accurately ascribed to the anæsthetic agent and in none of these was novocaine used. Taking a corrected mortality-rate from the statistics which contained these deaths and leaving out all others there were 44,241 administrations with four deaths due to anæsthesia; mortality-rate 1 in 11,060. The mortality-rate of ether anæsthesia is calculated by Neuber as 1 in 5930.

There is more danger if the anæsthesia is made to extend up the cord than when it is only used for operations upon the pelvis and legs. If it reaches up to the fifth dorsal segment, as it must for upper abdominal operations, there is splanchnic dilatation and great fall of blood pressure which may be so low that the medullary centres are not kept oxygenated. The remedy for this is the head-down position; the injection of adrenalin which has only a short action, or better the administration of ephedrine. This last drug I believe to be of the greatest use. It causes peripheral vaso-constriction and keeps up the general blood pressure in spite of the block of the vaso-constriction fibres in the splanchnic nerves. A comparison of a typical blood pressure chart (Fig. 3), where no ephedrine was used with the two charts (Figs. 4 and 5), where this drug was administered soon after the spinal

[12] M. Franke: Deut. Zeit. f. Chir., 1927, ccii., 262.
[13] Zentrbl. f. Chir., 1928., lv., 1930.
[14] Monatschr. f. Ohrenheilk., 1921, lv., 887.
[15] Arch. Int. Med., 1926, xxxviii., 405.
[16] Minnesota Med., 1928, xi., 744.

jection, shows how the dreaded drop in blood ressure can be completely avoided. Because of the ll in blood pressure hæmorrhage or shock are held

FIG. 8.



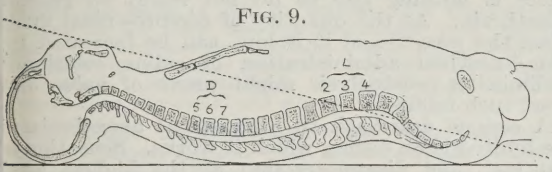
Position for injection.

be important contra-indications to spinal anæsesia. Desplas and P. Miller,[17] however, relate some traordinary cases of severe shock which were erated upon under spinal anæsthesia with success, nd the following case makes me wonder whether inal anæsthesia cannot be used with advantage in ses of hæmorrhage, especially now that ephedrine is ailable, a drug which I had not at my disposal hen I operated upon this patient.

A woman of 47 had been in hospital two years before for ematemesis.

March 24th, 1928: Readmitted for hæmatemesis; alleged have brought up 2 pints the evening before. April 2nd: spite of Lenhartz diet brought up 1 pint pure blood in orning and 1 pint blood and gastric contents in afternoon. h: Another pint of blood brought up; pulse 120. 5th: rgeon consulted; pulse 116, but fell to 110 before operaon; small wave; very severe anæmia, 40 per cent. emoglobin. Operation, using 1 c.cm. of 10 per cent. ovocaine intraspinally. There was no serious collapse

FIG. 9.



he dotted line represents the horizontal when the body is in the 20° head-down position. Note the relative directions of the spinal curves in this position.

nd the anæsthesia extended right up to the upper abdomeno chronic ulcer was found. The patient recovered in spite this needless operation.

On another occasion a woman of 51, very toxic, wasted om a growth of the sigmoid colon, had only 44 per cent. Hb. he usual technique with the head-down position for anæsesia was employed. She went through the resection peration without giving any anxiety. The blood pressure ll from 120 mm. Hg at the beginning of the operation to 4 mm. Hg its lowest point 27 minutes later. The pulse as 108 before operation, 112 at the end.

That the method can be employed when the blood ressure is low on occasion the following case shows:—

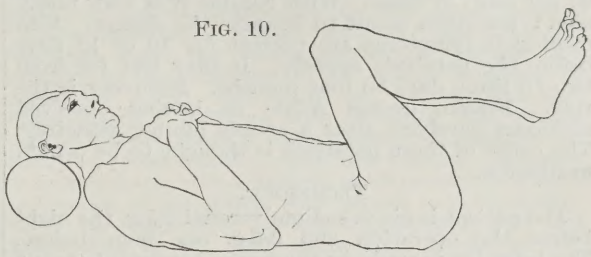
A man of 42 had recurrent symptoms of indigestion nd pain four years after a Billroth 1 operation. One month efore he was said to have had a hæmatemesis, and on his isit to the hospital he actually had one in the out-patient epartment. Hb. 62 per cent.; blood pressure 90 mm. Hg. njection of 1 c.cm. 10 per cent. novocaine hydrochloride ntraspinally with 50 mg. ephedrine subcutaneously. Good pper abdominal anæsthesia. Many adhesions found around te of old anastomosis fixing it to liver and gall-bladder. nterior gastro-jejunostomy performed. Blood pressure ever fell below 84 mm. Hg (see Fig. 5).

How great a fall of blood pressure can be withstood ithout danger to life I am not able to say. I have een very great diminution of blood pressure, and the atient, although looking pale and having a very eak wrist pulse, expressed himself as being comfortble. Thus a man who was having his prostate emoved suffered a drop in blood pressure from 160 o 68. Another patient, a woman of 30, with a blood ressure of 100 mm. Hg, was operated upon for gallstones under high spinal anæsthesia. Her blood ressure of 100 fell in 15 minutes to the extraordinary ow figure of 20 when ephedrine was given (Fig. 6). No alarm was felt for her safety. She was conscious, answered questions, and showed no signs of collapse.

Whether a high blood pressure is a contra-indication or not is also uncertain. A woman with a blood pressure of 240 mm. Hg had a gastrectomy for carcinoma performed. Her blood pressure fell to 120 mm. Hg. There was no anxiety about her condition felt (Fig. 7). The greatest depression lasts for only a short time when the pressure begins to rise again. The organism seems quite capable of functioning for a short time with a very low general blood pressure, the head-down position helping to maintain a sufficient circulation through the brain. It is possible, however, that too great a risk is run in the case of very old people with high spinal anæsthesia, for accommodation of the state of their vessels is not so easy.

Another contra-indication to spinal anæsthesia is said to be deep jaundice. I cannot support this

FIG. 10.



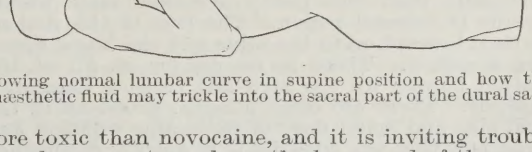
Showing obliteration of lumbar curve; the first position after injection.

contention; all the available evidence tends to show that spinal novocaine has less toxic effect upon the liver than general anæsthesia. I was once forced, because of a serious lung affection, to operate under spinal anæsthesia upon an intensely jaundiced woman who had had an obstruction of the common duct for some weeks. It was a complete success.

An important contra-indication to spinal anæsthesia would seem to be septicæmia, in which lumbar puncture itself is liable to be followed by the determination of the organism to the spinal canal.

Of paralyses of the sphincters, lower limbs, and cranial nerves after spinal anæsthesia it is difficult to find reliable information. C. Lepoutre[18] and P. Bazy[19] both relate single cases where some sphincteric trouble remained permanently after spinal anæsthesia. But no details of the operation are given except that they were hernias and no mention of the site of puncture, drug used, or dose. Stovaine is

FIG. 11.



Showing normal lumbar curve in supine position and how the anæsthetic fluid may trickle into the sacral part of the dural sac.

more toxic than novocaine, and it is inviting trouble to make a puncture above the lower end of the cord. There are, however, two cases of permanent paralysis after novocaine anæsthesia reported in the literature by M. Franke.[20]

(1) A varicose vein operation was done after the injection of 4 c.cm. of 5 per cent. novocaine-adrenalin solution. The patient died from pulmonary embolism on the sixth day, having had symptoms of myelitis. Post-mortem swelling of the cord and hæmorrhages up to the medulla were found. (2) After a similar operation the patient had symptoms of acute myelitis followed by paralysis of the legs, bladder, and rectum for two years. The tablets used were analysed and the adrenalin found to be decomposed.

[17] Presse médicale, 1918, xxvi., 234.

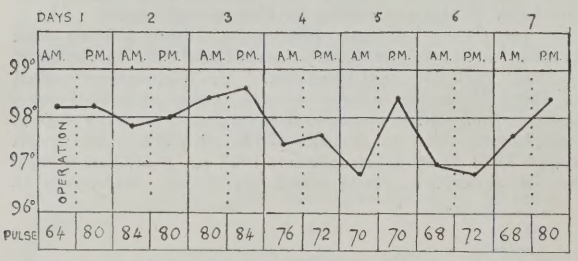
[18] Bull. et Mém. Soc. Nat. de Chir., 1927, liii., 456.
[19] Ibid., p. 243.
[20] Deut. Zeit. f. Chir., 1927, ccii., 262.

In 1906 Lieble, of Heidelberg, found such products of the decomposition of adrenalin to be irritating. Probably this is what caused the damage. Even pure adrenalin may be harmful as Barker pointed out (see above). It seems clear that adrenalin should not be employed in the spinal canal. Sometimes slight and evanescent meningeal symptoms appear after spinal anæsthesia. They may result from an irritation of the very sensitive membranes, for different observers have found a little increase of albumin, of the number of cells, of the sugar-reducing substance in the subsequently withdrawn cerebro-spinal fluid. Such symptoms never persist long. More serious are the ocular paralyses which sometimes come on after spinal anæsthesia. J. Rollet [21] has written a good account of them. He says the frequency is about 1 in 300 cases, but Bérard had only 2 in 3000 cases and Ducuing only 1 in 6000 cases. The abducent nerve is the one affected in 90 per cent. of cases. With cocaine it is very rarely seen; adrenalin seems to increase the danger. Mild meningeal symptoms are present for 10 or 12 days before the paralysis appears. It may last for from two to three days to four months. Recovery is the rule. Franke quotes Adam as having observed abducens paralysis after a simple lumbar puncture. The cause of these paralyses is thought to be a mild meningitis.

TECHNIQUE.

The patient is given sodium veronal 0·5 g. the night before the operation and 0·5 g. one hour before. The injection is made in the space between L. 2 and L. 3, or L. 3 and L. 4, in the middle line with a fine needle (1 mm. in diameter), the patient lying on his left side (Fig. 8). Cerebro-spinal fluid is not allowed to escape beyond a few drops and 1·0 to 1·2 c.cm. of 10 per cent. novocaine slowly injected. Immediately the patient is turned on his back and his legs flexed as in Fig. 10. If this were not done the solution might flow down into the sacral region, as can easily be seen from Fig. 11 drawn from Braun's plates and Fig. 9. At the same time the head end of the table is lowered

FIG. 12.



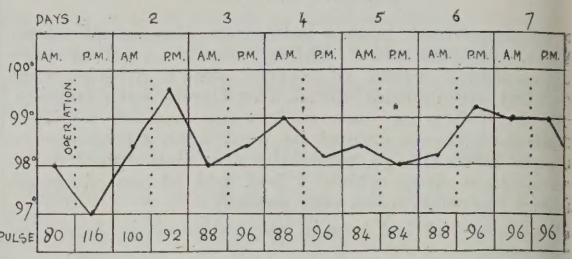
Female, aged 58. Carcinoma of stomach. Gastrectomy.

so as to make an angle of about 15 degrees with the horizontal, that the heavy solution may trickle towards the dorsal region. The legs of the patient are then lowered on to the table and the knees flexed over a pillow. There is no danger at all of the solution flowing up too high and causing dangerous paralysis. There are large margins of safety in the small size and small dose of novocaine solution and in the fact that the anæsthetic is quickly diminished in strength as it trickles upwards, partly because it becomes fixed by the nerve-roots, partly because of the rapid absorption which takes place from the spinal canal. The operation can usually be begun in about 8–10 minutes.

A great fall of blood pressure can be combated by the injection of ephedrine (0·05–0·1 g.). It is a little difficult to choose the right time to administer this. If given at the same time as the spinal injection a great and abnormal stimulus seems to be given to the circulation and the drug absorbed into the blood-vessels of the spinal canal before it has had good opportunity to soak into the nerves. It is probably better to wait until the blood pressure has fallen considerably, denoting that the anæsthetic has reached a fairly high level before giving the ephedrine, it being borne in mind always that absorption from the subcutaneous tissue in a collapsed patient is very poor.

Rarely quite unaccountably, although a good puncture has been made, the anæsthesia fails almost completely, or it does not reach high enough, or is evanescent in action. Failure to reach a proper level seems to be due to insufficiency of cerebro-spinal fluid denoted by low cerebro-spinal pressure and slow flow of the fluid from the needle

FIG. 13.



Female, aged 45. Hour-glass stomach. Billroth I. operation.

on puncture. Under such circumstances there is very little space between the cord and its membranes; indeed, in the dorsal position these structures may actually be in contact. There is a mechanical obstacle to the flow upwards of the anæsthetic solution behind the cord and between the maze of posterior roots. There is nothing else to do but resort to general anæsthesia. As the quantity of cerebro-spinal fluid, when the pressure of it is low, can be increased by intra-intestinal administration of saline solution,[22] preliminary proctoclysis might prove of value and avert such failures.

A serious drawback to high spinal anæsthesia is the limited time during which it works. Sensation is lost last, and disappears first at the highest level reached, so that it may be returning at the site of operation 45–50 minutes after the first incision was made. The time allowed is quite sufficient for a gastro-enterostomy or cholecystectomy, but is not always sufficient for a long gastrectomy. Under such circumstances I have been obliged to employ some general anæsthesia to complete the operation, but a plan has occurred to me which I have not yet put to the test. It is to finish the operation under anterior splanchnic block and local novocaine infiltration of the margins of the wound. At the stage at which such assistance is required the stomach and duodenum would be already cut across and the pancreas freely exposed to view. The splanchnic injection could be given with great nicety.

CONCLUSION.

High spinal anæsthesia, if a careful technique be followed, is accompanied by very little risk. It possesses many advantages over general anæsthesia, reducing to a minimum shock and post-anæsthetic disturbance. (Vide Figs. 12 and 13.)

It is not recommended that in the present stage of development it should be adopted as the routine method. A more perfect technique no doubt can and will be developed. As it is, it has reached a stage so satisfactory that certain operations become possible which otherwise would be fraught with great risk if performed under ether. It could certainly be used more frequently for upper abdominal work with advantage. Neither the technique recommended nor the views expressed in this paper have reached finality. The method seems to me to be in process of evolution. I have brought forward such facts as have come under my notice with the object of stimulating investigation and research in a very valuable surgical method.

[21] Jour. de Méd. de Lyon, 1928, ix., 167.

[22] F. E. B. Foley and T. J. Putnam: Amer. Jour. Physiol., 1920, liii., 464.

THE BLOOD-PLATELETS IN SPLENIC ANÆMIA,

WITH SPECIAL REFERENCE TO TREATMENT BY SPLENECTOMY.*

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Splenic anæmia, of the type often associated with the name of Banti, is a condition or group of conditions the pathogenesis of which is still quite obscure. In the original descriptions it is obvious that the term was used to include a number of specific conditions which have since been separated, such as syphilis, malaria, cirrhosis of the liver, aleukæmic leukæmia, and kala-azar (infantile splenic anæmia). The clear distinction of acholuric jaundice and the splenomegalies of the Gaucher, Niemann, and hypercholesterinæmic types still further encroach on the territory of "splenic anæmia." In the residue of cases after the exclusion of the above-mentioned groups the splenomegaly has been thought to be "primary" because of (*a*) the early appearance of the splenic tumour, (*b*) the appearance of fibrosis earlier in the spleen than in the liver, (*c*) the beneficial effects of splenectomy in many cases. Perhaps the best summarised description of the syndrome is that given by Tidy.[1]

"A chronic disease of unknown origin, characterised by enlargement of the spleen without enlargement of the lymphatic glands, by anæmia, recurrent hæmorrhages, and, in the later stages of certain cases, cirrhosis of the liver. Further, the group is akin to various other groups—e.g., to some of the liver and spleen diseases with varying degrees of icterus and hæmorrhages, and to some manifestations of the hæmorrhagic diathesis. Certain definite factors can produce indistinguishable syndromes—e.g., syphilis, thrombosis of the portal and splenic veins."

No definite infective agent has been constantly found, although Gibson [2] has described the isolation of a streptothrix from certain cases. It is possible that several ætiological factors still remain to be distinguished. The two chief theories of causation are:—

1. A primary inflammatory sclerosis of the spleen, ascribed, in the absence of any proved organismal agent, to a fibrogenic toxin (Moschowitz [3]). This supposes that the splenic sclerosis leads to increased blood destruction.

2. Primary vascular derangement. This was suggested by the frequent association—be it cause or effect—of thrombophlebitis of the splenic and portal veins. It is known that the congenital abnormality of persistence of the umbilical vein may cause a similar picture, suggesting that purely vascular disturbances can produce the syndrome. (Eppinger [4] has described two cases of this condition and mentions those of Cruveilhier, Baumgarten, Masura, Benque.) The present paper, however, limits itself to a consideration of thrombosis and hæmorrhage, and attempts to evaluate the importance of the blood-platelets in connexion with these two features, especially after splenectomy, which is admittedly the only effective treatment.

1. *Hæmorrhage.*

The best-recognised type of hæmorrhage in splenic anæmia is hæmatemesis, which occurs in a large number of cases, and may be massive and recurrent. It is ascribed to kinking of engorged vasa brevia or to dilated œsophageal varices. There is no doubt that in many cases this mechanical explanation is adequate. While hæmatemesis is frequent hæmorrhages from other sites are described, such as epistaxis, bleeding gums, hæmaturia, menorrhagia, hæmorrhages from the bowel, and even purpura. As long ago as 1914 Ziegler [5] suggested an associated hæmorrhagic diathesis, and since then the association of a diminished platelet count has been mentioned by Eppinger, Frank, and Rosenthal.[6] Eppinger [4] refers to a case of "fibro-adenie" with diminution of the platelets and purpura. Frank,[7] referring to the condition as "aleukia splenica," speaks of five cases of "splenopathie mit hypoleukie und thrombopenie." It is interesting to note that in 1921 so acute an observer as Moynihan [8] doubted that the mechanical explanation was sufficient entirely to explain the hæmatemesis, and suggested the possibility of a toxic origin. Thus hæmorrhage may be ascribed to (*a*) a local mechanical factor, and (*b*) a general hæmorrhagic tendency.

2. *Thrombosis.*

Thrombophlebitis of the splenic and portal veins, with sclerosis and sometimes calcification of the vessel wall, has been very frequently described since its demonstration in 1904 by Dock and Warthin.[9] It is uncertain whether the thrombosis or the splenomegaly is primary, or whether both processes may be produced contemporaneously by the same agency. Continental authors, notably Cauchois [10] and Eppinger, maintain that the thrombophlebitic changes are primary in the majority of the cases; Eppinger in particular would distinguish a "thrombophlebitic splenomegaly" differing both clinically and pathologically from Banti's splenomegaly. Clinically he describes splenomegaly, secondary anæmia, tendency to hæmorrhage, with a definite ætiological factor such as trauma, or childbirth, with ascites as a subsidiary aid to the diagnosis. He admits, however, that this description is not pathognomonic. Pathologically his account of the "thrombophlebitic" spleen is practically identical with that of the "Banti" spleen, the only differences being that in the former the thrombosis of the splenic and portal veins is more prominent, while the liver shows fatty but not cirrhotic changes. Kaznelson [11] insists that the thrombophlebitic splenomegaly can be diagnosed with certainty during life. He regards splenectomy as contra-indicated, partly because he regards the splenomegaly as secondary and partly because in four out of six cases described by Eppinger splenectomy did not in any way check the course of the disease. He also describes the case of a woman who, five years after splenectomy, died with thrombosis of both femoral veins, portal thrombosis, and ascites. He states that the platelets were numerous. The view usually held in this country is expressed in Tidy's summary that the syndrome produced by splenic and portal thrombosis is indistinguishable from the Banti syndrome. It is interesting to note that at any rate Kaznelson recognises (*a*) that there is a type of splenomegaly with a special tendency to thrombosis, and (*b*) that he regards splenectomy as inadvisable in these cases.

Recently attention has been called by the Mayo Clinic to portal and mesenteric thrombosis as a very fatal post-operative complication of splenic anæmia. W. J. Mayo [12] states that of the 10 per cent. of patients who died in hospital after splenectomy the majority died from progressive thrombophlebitis extending from the splenic pedicle into the portal system.

Wilkins,[13] investigating embolism and thrombosis in the portal system, comes to the following conclusion:—

"Splenic thrombosis usually results from splenectomy for splenic anæmia, by propagation of the normal process of thrombosis from the ligated end of the splenic vein. Thrombosis of the superior mesenteric vein usually results from retrograde extension of portal or splenic thrombosis, giving rise to mesenteric infarction. Splenectomy is the only type of operation which predisposes to mesenteric thrombosis, the factors being stasis from splenomegaly, cirrhosis, dilatation, and tortuosity of the splenic vein with degenerative changes in its walls, hæmorrhage from separating adhesions, trauma attending the removal of the enlarged spleen, ligation of the splenic vein, and finally infection, which is probably always present in the disorganised spleen and in the degenerated wall of the splenic vein in splenic anæmia."

The present communication owes its inception to a remarkable paper by Rosenthal [6] in which the importance of the blood-platelets in these two opposite conditions of thrombosis and hæmorrhage was first emphasised. He described a series of 16 cases of splenic

* A paper read before the Association of British Physicians.

anæmia splenectomised between the years 1909 and 1924. His description of the cases is as follows :—

"All these patients had splenomegaly, secondary anæmia, and leucopenia, and complained mainly of weakness, repeated gastric hæmorrhages, less often of nasal hæmorrhages, generalised bleeding (purpura), and pain in the left upper quadrant of the abdomen. Cases of syphilis, malaria, tuberculosis, leucopenic leukæmia, and cirrhosis of the liver were excluded from this group."

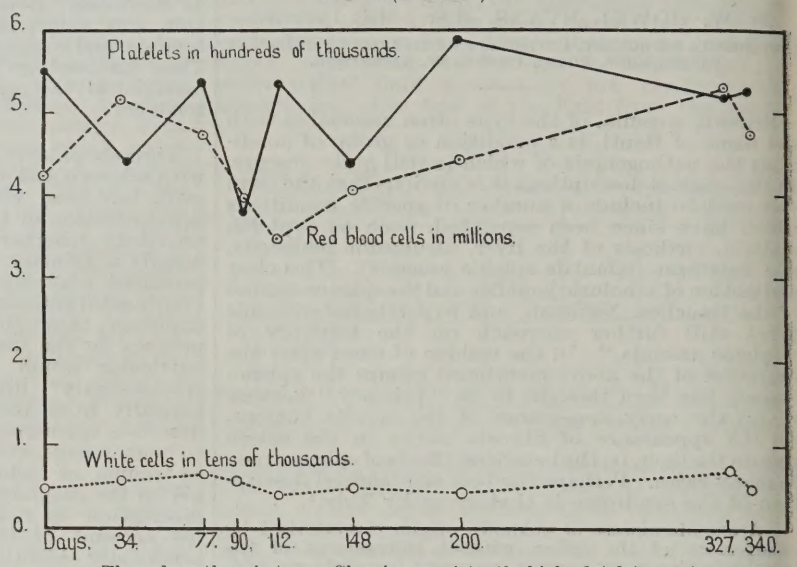
The operative results from the group of 16 cases showed 10 successes, 3 for as long as ten years, 1 for nine years. There were 6 failures with 3 deaths in the first year from widespread portal thrombosis. Three cases remained unimproved with repeated mesenteric and other thromboses. The last nine cases were studied in detail, especially on the platelet count before and after operation. On this basis he divided them into two groups :—

(*a*) *Thrombocytopenic Group* (five cases).—The platelets were very low before operation. After operation they rose for a short time and then fell to normal or slightly above. (In one case nine years after operation the count was 350,000.) In these patients the hæmorrhages were marked and were not always from the stomach (e.g., hæmorrhages from gums, epistaxis, hæmaturia, purpura). Rosenthal states that most of these patients had slightly prolonged bleeding time and in some cases poor retraction of the clot.

(*b*) *Thrombocythæmic Group* (four cases).—Platelets normal or somewhat subnormal before splenectomy, but afterwards rose rapidly to high levels (1,000,000+) persistently maintained for months and years. One case died from mesenteric thrombosis and three remained unimproved after suffering from thromboses in various sites—e.g., mesenteric, brachial, jugular, and femoral veins. In this group hæmorrhagic symptoms were less marked, and one of the cases gave no history of hæmorrhage before operation. In a few cases of apparent Banti's disease not splenectomised he observed "platelet crises" or marked temporary elevations which he thinks may produce thrombosis in the portal system before splenectomy. From these observations Rosenthal goes so far as to regard the two groups as ætiologically distinct. In the thrombocytopenic group he considers the splenomegaly to be primary, on account of the good results of splenectomy which he ascribes partly to the removal of a thrombocytolytic factor and partly to the mechanical relief of engorged abdominal veins and viscera. The suggestion here is that either the primarily diseased spleen is overactive in destroying platelets produced in normal numbers or that it inhibits production. In the thrombocythæmic group he thinks that the primary factor is an increased production of platelets, comparable to the increase of leucocytes in leukæmia, and that the splenic enlargement is secondary and represents an attempt to keep down the numbers of the circulating platelets—assuming that the spleen is the main platelet-destroying agency. After splenectomy fatal thrombosis may occur before the rest of the reticulo-endothelial system becomes adequate to deal with the increased number of platelets. Rosenthal does not correlate his "thrombocythæmic group" with the "thrombophlebitic" type, and states that they did not correspond with Eppinger's thrombophlebitic type.

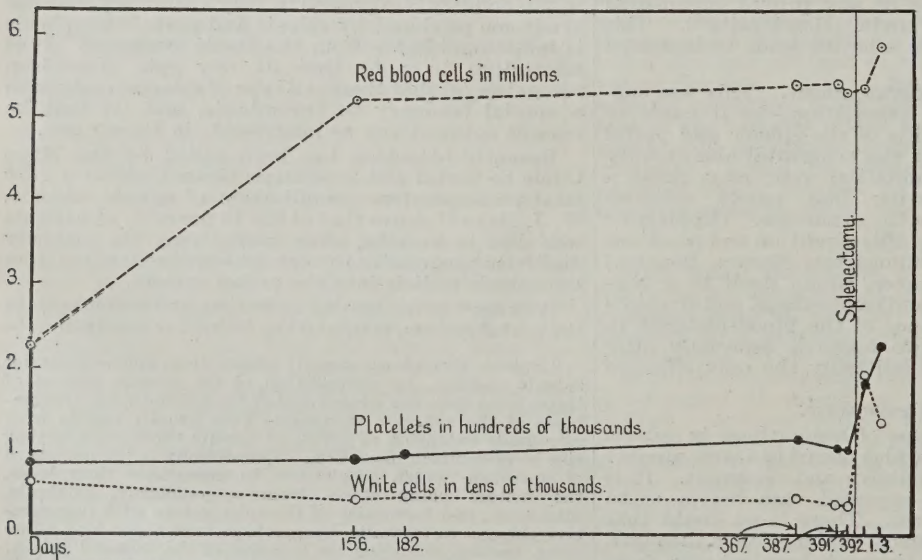
While his interpretation may be open to discussion, his paper is especially important because it is the first serious study of the platelets during life in splenic anæmia, and because it attempts to correlate the increase of the platelets with the tendency to thrombosis.

FIG. 2 (Case 15).



Thrombocythæmic type. Showing persistently high platelet count.

FIG. 1 (Case 5).



Thrombocythæmic type. Showing persistently low platelet count.

Since reading Rosenthal's paper I have had the opportunity of observing 19 cases of splenomegaly with anæmia which may fairly be described as "splenic anæmia" from the following criteria.

1. Anæmia with little evidence of regeneration (no increase of reticulocytes and nucleated forms) except in immediate post-hæmorrhagic regeneration.
2. Leucopenia as a rule—never leucocytosis.
3. Absence of clear evidence of hæmolysis—i.e., van den Bergh reaction normal; fragility normal; the only possible evidence of hæmolysis being increased output of urobilin.
4. Wassermann negative.
5. No other obvious cause.

In addition to these 19 cases three apparently similar cases were found to have a strongly positive Wassermann reaction—a high proportion, emphasising the importance of excluding syphilis. In nine of the cases only a single routine observation was made, but in the others a number of records were taken. The platelets were counted by an indirect method, modified from that described by Bedson,[14] which gives an average count of about 300,000 for a large number of normal persons. It will be seen from the table that in the platelet count the cases fall into three groups.

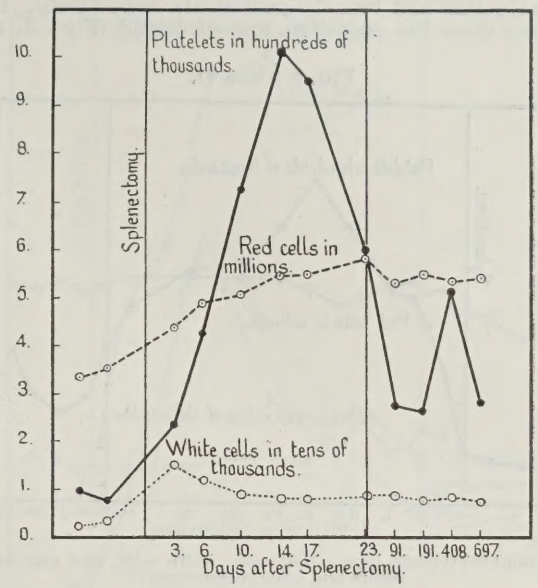
Group 1 (*Cases 1–9*), corresponding to Rosenthal's thrombocytopenic type. The platelets are markedly reduced, most of the counts falling round about 100,000, the lowest count being 53,000 in Case 9. Leucopenia was also definite. All these cases gave evidence of hæmorrhagic tendency; four had repeated hæmatemesis, epistaxis occurred in five cases, bleeding gums in three, purpura in three, menorrhagia in two. As a general rule there was moderate prolongation of the bleeding time and the clots retracted poorly.

That the thrombocytopenia may be persistent is shown in Case 5 (Fig. 1). This patient was observed for a year before splenectomy and, in spite of the repair of the anæmia which followed a large hæmatemesis shortly before he was first seen, the platelets and leucocytes) remained persistently low during the whole period.

Group 2 (*Cases 10–16*).—In this group, corresponding to Rosenthal's thrombocythæmic group, the platelets were normal or, as in Case 15, increased. The leucocyte counts also were not quite so low. In six of the seven cases no history of hæmorrhage could be obtained, and the bleeding time and clot retraction were normal.

Case 15 (Fig. 2) is especially interesting. Observed for about a year, the platelets were always distinctly above normal. The bleeding time varied from normal (one and a half minutes) to five minutes. Clot retraction was always good, and clotting time rather reduced. During this period the patient had several attacks of abdominal pain followed by melæna, which were at first thought to be due to minor mesenteric thromboses. Recently, however, he has had purpuric hæmorrhages for which it seems impossible to account on a basis of thrombosis.

FIG. 3 (Case 4).



Thrombocytopenic type. Red cells, white cells, and platelets, before and after splenectomy.

Group 3 (*Cases 17–19*).—These cases show intermediate counts, but further study of this group is desirable, as in Cases 18 and 19 only a single observation was made.

Further observations, which cannot be dealt with fully here, were that in the low platelet cases a slight delay in clotting time and marked failure of clot retraction were invariably present, whereas in the thrombocythæmic group the clotting time was normal or somewhat shortened and the clot retraction good. After splenectomy the clotting time shortens slightly during the period of platelet elevation in all the cases, and returns to normal as the platelets return to normal. The retractibility of the clot is also much increased. In the only thrombocythæmic case splenectomised the shortening of clotting time was persistent and

TABLE SHOWING BLOOD FINDINGS AND CHIEF CLINICAL SYMPTOMS IN NINETEEN CASES OF "SPLENIC ANÆMIA."

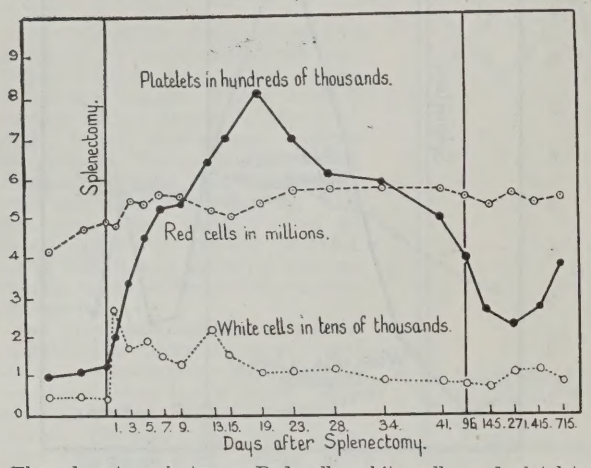
No.	Age.	Sex.	Hb.	Reds in millions.	Whites.	Platelets in thousands	Bleeding time in minutes.	Chief clinical symptoms.
1	31	M.	70	3,850 (0·4)	2812	120	5	15 yrs.; epistaxis; purpura; pain.
2	25	F.	45	3,450 (2·8)	3428	92	5 +	5 yrs.; epistaxis; bruising; menorrhagia; bleeding gums.
3	26	F.	82	4,560 (0·6)	4375	116	3	3 yrs.; bleeding gums; bruising; menorrhagia.
4	34	F.	35	3,525 (0·6)	3125	75	6 +	5 yrs.; anæmia; weakness; bleeding gums; purpura.
5	18	M.	35	2,250 (0·6)	6562	87	4 +	Hæmatemesis, aged 8; anæmia and hæmatemesis, aged 17; epistaxis, aged 18.
6	19	M.	83	4,575 (0·2)	4062	97	5 +	2 yrs.; weakness and pain; epistaxis; bleeding gums; purpura.
7	29	M.	45	4,215 (0·31)	4396	104	4	7 yrs.; repeated hæmatemesis; pain.
8	20	M.	43	3,670 (0·4)	4062	81	6	1 yr.; epistaxis; pain; several hæmatemeses.
9	56	M.	39	2,440 (1·9)	3438	53	5 +	10 yrs.; anæmia; pain; 4 years repeated hæmatemeses.
10	16	M.	38	3,725 (0·6)	5000	246	1	2 yrs.; pain; weakness; no hæmorrhages.
11	32	F.	44	4,050 (0·3)	9844	312	1¼	8 mths.; anæmia; weakness; pain; no hæmorrhages.
12	20	F.	36	3,800 (0·6)	7187	226	No note.	2 yrs.; anæmia; weakness; no hæmorrhages.
13	5	M.	40	3,850 (0·8)	7188	292	1½	3 mths.; weakness; anæmia; not seen again.
14	53	F.	45	4,850 (0·3)	3188	287	"Normal"	3 yrs.; pain; weakness; no hæmorrhages.
15	25	M.	48	4,260 (0·7)	4843	550	1½ and 5	3 yrs.; pains; dyspepsia; hæmorrhage from bowel; purpura.
16	7	M.	30	2,880 (2·4)	6568	354	2	6 mths.; weakness; anæmia; no hæmorrhages.
17	34	M.	88	4,700 (0·3)	3125	191 and 148	1½	1 yr.; weakness; pain; no hæmorrhages.
18	30	F.	38	4,200 (0·8)	4062	151	1½	5 yrs.; recent large hæmatemesis; pain.
19	29	F.	45	3,420 (0·5)	6875	163	2½	6 mths.; pain; weakness; no hæmorrhages.

progressive until death. Full details are given in a paper in the *Journal of Pathology and Bacteriology*, 1928, xxxi., 815.

Operative Results.

Thrombocytopenic Group.—Five cases were splenectomised and two died on the fifth day from intestinal obstruction and broncho-pneumonia respectively. In three cases the operation was successful (Figs. 3, 4,

FIG. 4 (Case 7).


Platelets in hundreds of thousands.
Splenectomy.
Red cells in millions.
White cells in tens of thousands.
1. 3. 5. 7. 9. 13. 15. 19. 23. 28. 34. 41. 96 145. 271. 415. 715.
Days after Splenectomy.

Thrombocytopenic type. Red cells, white cells, and platelets before and after splenectomy.

and 5†); two of these have been followed for two years. No. 6 absconded from the hospital a few weeks after the operation and was not traced. The platelet curves of these three patients are very similar. The platelets rise after splenectomy to a maximum of about a million in a little over a fortnight, and a further fortnight sees a considerable return towards normal. A normal count was reached in Cases 4 and 7 in about 90 days, and since then the platelets have fluctuated but little. Two years later both patients are well, the anæmia has disappeared, no further hæmorrhages have occurred, and both are back at work, No. 7 as a coal-miner and No. 4 as a housewife. Although the observations in Case 6 only covered 32 days, the shape of the platelet curve is quite similar to the others. It cannot be said that restoration to health for a period of two years is conclusive proof of complete cure, seeing that in many cases the natural course of the disease without splenectomy may be much longer than this. In both cases, however, the condition before operation was desperate—they certainly would have been dead by now unless they had been relieved.

Case Reports of Splenectomised Cases.

Thrombocytopenic Group.—CASE 4, female, aged 34. Five years' history, beginning shortly after delivery. Onset with anæmia, weakness, and left-sided pain. In the last two years bleeding gums and generalised purpura. Wassermann negative; van den Bergh less than 1 unit; urobilin in urine increased. Operation Feb. 21st, 1926. Weight of excised spleen 1380 g.

CASE 6.—Male aged 19. Two years' history, weakness and left-sided pain. Occasional nose-bleeding and frequent oozing from gums. Slight trauma produced severe ecchymoses. Wassermann negative; van den Bergh less than 1 unit; urobilin in urine increased. Operation Feb. 15th, 1927. Weight of excised spleen 1470 g.

CASE 7.—Male aged 29. Attacks of left-sided pain for seven years. Recurrent large hæmatemeses at intervals in the last four years. X ray of stomach negative. Wassermann negative; van den Bergh less than 1 unit; urobilin in urine usually normal. Operation Nov. 17th, 1925. Weight of excised spleen 840 g.

CASE 5.—Male aged 18. Large hæmatemesis when 8 years old. Afterwards always delicate, but no further hæmorrhages until ten years later, when there was rapid development of anæmia culminating in a massive hæmatemesis. Severe epistaxis shortly before splenectomy. Wassermann negative; van den Bergh less than 1 unit; urobilin in urine usually normal. Operation Oct. 28th, 1927. Spleen buried in dense adhesions; operation completed with difficulty. Weight 640 g. Intestinal obstruction due to kinking of splenic flexure. Death on the fifth day. Necropsy refused.

CASE 9.—Male aged 56. About ten years' history of anæmia and splenomegaly. Much X ray treatment to spleen in earlier stages. In last four years repeated large hæmatemeses; several just before operation. Slight icteroid tint. Wassermann negative; van den Bergh indirect test gave 1·5 to 2 units; urobilin in urine markedly increased. Operation Dec. 30th, 1927. Weight of excised spleen 1520 g. Death from broncho-pneumonia on fifth day. Necropsy refused.

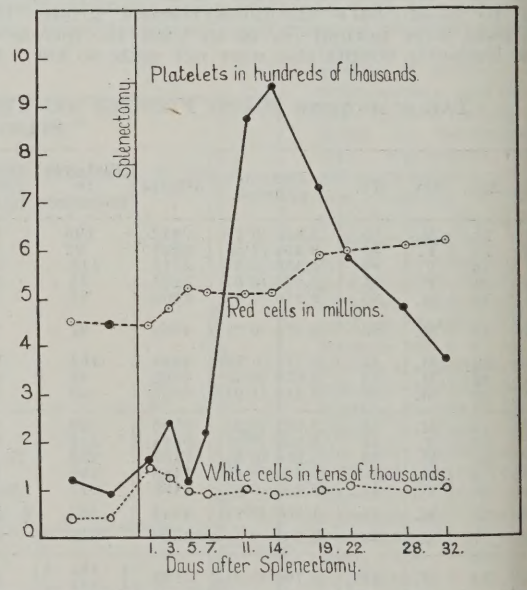
Thrombocythæmic Group.—Only one splenectomy was performed. As this patient died from mesenteric thrombosis splenectomy has been considered unjustifiable in other cases of this type.

CASE 10.—Male aged 16. Anæmia for some years. For two years pain, weakness, and increasing anæmia with nausea and occasional vomiting. No hæmorrhage. Wassermann negative; van den Bergh less than 1 unit; urobilin in urine markedly increased. Operation Sept. 29th, 1926. Weight of excised spleen 380 g. Persistent elevation of platelets after splenectomy with death on the thirty-first day. Several examinations of the stools in the few days immediately before death showed the presence of occult blood. Necropsy showed a recent thrombosis spreading from the splenic pedicle into the uppermost branches of the superior mesenteric vein, with gangrene of a proximal loop of the small bowel. The portal vein was patent. The splenic and superior mesenteric veins showed histologically a moderate degree of thickening, but no old thrombosis and no calcification. The liver showed a moderate degree of fatty change, but no cirrhosis.

The Morbid Histology of the Excised Spleen.

This paper does not concern itself with the histopathology of the disease and detailed descriptions are therefore omitted. It is, however, important to

FIG. 5 (Case 6).


Platelets in hundreds of thousands.
Splenectomy.
Red cells in millions.
White cells in tens of thousands.
1. 3. 5. 7. 11. 14. 19. 22. 28. 32.
Days after Splenectomy.

Thrombocytopenic type. Red cells, white cells, and platelets before and after splenectomy.

mention that the six spleens examined gave no evidence of other specific disease. They all showed very close resemblances, and no histological difference could be determined between the five spleens from the low platelet cases and that of the single thrombocythæmic case. Thickening of the capsule and trabeculæ was constant. Overgrowth of the reticulum cells with irregularly spreading fibrosis was present in

† Figs. 3, 4, 5, and 6 are reproduced by the courtesy of the Editor of the Journal of Pathology and Bacteriology.

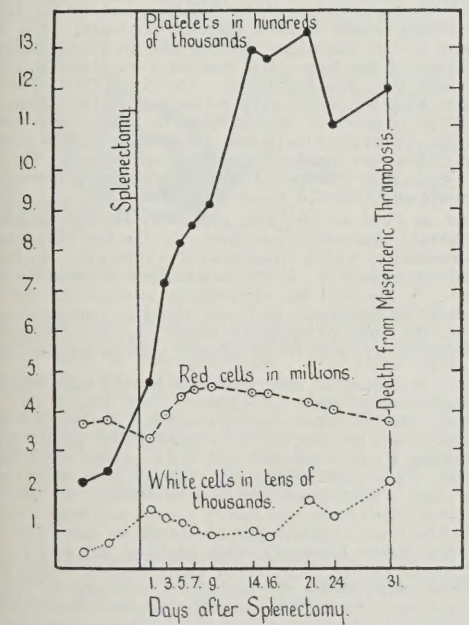
arying degree, but always marked. The fibrosis of he pulp encroached on the lymphoid follicles in an rregular way; in some parts of the organs the follicles vere fairly numerous, in others almost completely lestroyed. In those follicles which remained the ymphoid elements appeared fairly normal, but hyaline hickening and tortuosity of the Malpighian artery was nvariably present. The splenic veins in the trabeculæ n most of the cases showed some degree of hyaline hickening, but thrombophlebitis within the organ tself was never observed. Examination of the stumps f the splenic veins at the hilus in all the cases showed ome degree of thickening and sclerosis, but never alcification. In Case 4 one of the large branches of he splenic vein was partially occluded by organised lot. Sections prepared by Levaditi's method were egative for *Spirochæta pallida* in all cases. Cultures vere made in four cases and were entirely negative. n no case was there evidence of siderosis.

This description agrees with the commonly described norbid changes in the Banti type, and more closely vith Eppinger's "Banti-milz" than with his thrombophlebitischer Milz."

Discussion.

It is evident from this confirmation of Rosenthal's vork, coupled with the observations of Kaznelson and Mayo, that the platelets are of considerable importance n splenic anæmia. First, it seems clear that in the ow platelet type of case, with subjective and objective vidence of hæmorrhagic tendency, splenectomy may e confidently recommended. Such patients are not mmune from the usual surgical risks, as shown by the wo post-operative deaths in the present series. If, owever, they survive the immediate operative azards, there would appear to be a good prospect of estoration to health. In the majority of our cases the peration was made appreciably easier by preliminary lood transfusion, which is desirable in cases with

FIG. 6 (Case 10).

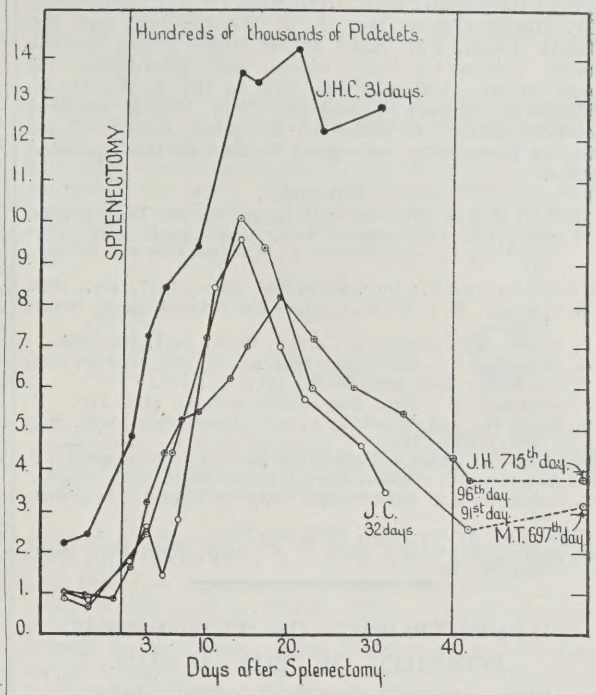


Thrombocythæmic type. Red cells, white cells, and platelets, before and after splenectomy.

hæmorrhagic tendency. In the other type of case, on the evidence available, splenectomy does not appear to be justified, as it exposes the patients both to the immediate risks and to the apparently inevitable danger of mesenteric or other thrombosis. On the other hand, it seems hardly justifiable to refuse splenectomy to patients who are doing badly, and appear likely to die unless relief is given. In these cases, however, the operation should only be undertaken with a very distinct realisation of its risks.

In the present state of knowledge it seems unsafe to go further and to make a definite ætiological distinc-

FIG. 7.



Composite curve of platelets before and after splenectomy, in Cases 4, 6, and 7 (thrombocytopenic) and in Case 10 (thrombocythæmic).

tion between the two types of case. In view of the current belief that the platelets are produced by the bone-marrow and destroyed by the reticulo-endothelial tissue in the spleen and elsewhere, Rosenthal's theory is tempting, but requires more support before it can be accepted. Further observations may yield important evidence both in regard to the origin of "splenic anæmia" and to the mechanism of platelet regulation.

Conclusions.

1. The hæmorrhagic tendency in splenic anæmia may be due to two factors: (*a*) A mechanical factor probably related to venous stasis associated with splenic and portal thrombophlebitis (hæmatemesis). This factor is not necessarily associated with thrombocytopenia. (*b*) An associated general hæmorrhagic tendency, which may be correlated with a deficiency of platelets. Such patients appear to be good operation risks and the prospects of permanent relief by splenectomy seem good.

2. Thrombosis of the splenic veins and portal vein is of frequent occurrence. It is possible in some cases that the venous thrombosis is the primary event (Eppinger's thrombophlebitic type), but differential diagnosis during life seems impossible.

3. Thrombosis, both in the portal system and in peripheral sites, may occur as a post-operative complication and may be correlated with a gross and persistent increase in the platelets after splenectomy. In some cases not operated on "platelet crises" may occur (Rosenthal) and possibly may be correlated with splenic and portal thrombosis.

4. It appears that, in the majority of patients exhibiting this thrombotic tendency, the platelets before splenectomy are usually normal or elevated. In these patients there appears to be considerable risk, after splenectomy, of thrombosis, which may be fatal. One cannot therefore recommend splenectomy with the same confidence as in those cases which present

thrombocytopenia associated with evidence of subjective and objective hæmorrhagic tendency.

It is a pleasure to acknowledge the interest taken in these investigations by my medical and surgical colleagues at the Royal Infirmary, Liverpool. I would particularly thank Prof. John Hay, Dr. J. C. Matthews, Dr. Henry Cohen, Mr. H. F. Woolfenden, and Mr. Frank Jeans, who have at all times given me the freest access to their cases, and permission for publication. I should also like to thank Mr. O. H. Williams, surgeon to, and Dr. C. H. Walsh, resident medical officer of, Mill-road Hospital, Liverpool, for similar permission in regard to two of the operated cases.

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HYPERTROPHY OF THE DISTAL PORTION OF THE ILEUM.

WITH A REPORT ON TWENTY-EIGHT CASES.

BY ROBERT MACKINLAY, M.B. TORONTO.

Sir W. Arbuthnot Lane, in his paper on the treatment of "Non-malignant Affections of the Colon,"[1] states: "This ileal kink is caused by an evolutionary band produced by abnormal loading of the bowel which is aggravated by the 'first and last' kink." For reasons suggested by the series of cases here described I believe that this ileal kink is caused by the cicatrisation of the lower leaf of the mesentery of the ileum as a result of recurrent attacks of appendicitis.

Six Representative Cases.

CASE 1, a man of 35, was in really good health until 1912, when, at the age of 20, he began to have what he called "bilious spells" of headache, vomiting, and abdominal pain. These spells gradually got worse and became more frequent. In 1915 the case was diagnosed as recurrent appendicitis, and appendectomy was advised. A diseased appendix was removed. His condition was not improved, and as time went on it gradually grew worse; the old symptoms were exaggerated and new ones gradually developed, until finally he never felt well. He was treated by me from 1921 to 1927 for gastro-intestinal disorders and cholecystitis. During that period I used alkaline bismuth mixtures, dimol, tonics, and lastly, large doses of hexamine with sodium bicarbonate, over a long period. The last-mentioned helped slightly, but the former did not help in the least. In 1927 he took an ocean trip, crossing the Atlantic twice, but this did not help. In the same year I advised a laparotomy and on May 27th I operated.

The symptoms just before the operation were: 1. Pain between the shoulder-blades—the most constant symptom. 2. Pain beneath the right costal margin, radiating round to below the right shoulder-blade. 3. Gas and a sour, hot, burning feeling in the stomach (so-called indigestion) after eating. What he ate did not seem to make any difference. 4. Frequent vomiting of meals, with much mucus, immediately after eating. 5. Severe pains in epigastrium at times. 6. Obstinate constipation. 7. Absence of any ambition or joy in living. 8. Nervousness, irritability, and inability to sleep well. 9. Much right frontal headache. 10. Constant weak miserable feeling. 11. Failure to feel refreshed after a night's sleep.

[1] THE LANCET, 1922, ii., 114.

The signs just before the operation were: loss of weight (140–118 lb.); pinched nervous expression; constant brownish-yellow tinge to skin; and tenderness over gall-bladder area.

The operation findings were: normal gall-bladder and cystic duct; normal liver and bile-ducts; normal stomach and duodenum; appendix had been cleanly removed. About six inches from the ileo-cæcal valve there was a marked contraction and thickening of the lower leaf of the mesentery supplying the ileum. This diseased area was about two inches long and caused a marked kinking and torsion of the ileum at that point. The walls of the ileum distal to the diseased lower leaf of the mesentery (i.e., from the kink to the cæcum) had the appearance of containing more blood than the normal proximal portion, were much thickened, and had a rubbery consistency. This contracted thickened lower peritoneal leaf was cut completely through and stretched so that the blood-vessels and subperitoneal structures of the mesentery were exposed. When this was done the kinking and torsion of the ileum were corrected and the circulation in the diseased portion of the ileum was improved.

On Sept. 25th, 1928, the patient reported as follows: 1. Gained 15 lb.; weight 133 lb. 2. Has a little gas after eating only when worried or when he bolts his food. These are the only occasions when food is brought up. 3. Has no mucus (or "phlegm" as he calls it). 4. Has no gnawing or sour, hot feeling in stomach. 5. Has no epigastric pain, but occasionally feels a little pain between his shoulder-blades. 6. Bowels evacuate regularly without medicine and are not in the least constipated. 7. Is full of "pep" and now can go out and enjoy life after a day's work. 8. After a hard day's work he sleeps restfully and awakens refreshed. 9. Not nearly so nervous and irritable. 10. He states that, though the immediate improvement was marked, he continues to improve.

CASE 2, a boy of 11, was well until 4 years of age, but since then has never had good health. He had frequent bilious attacks (vomiting, severe frontal headache, and felt very weak), which lasted from a few hours to two days. These bilious spells usually started at night, but strenuous games or indiscretion in eating would cause them. He never felt hungry and had much frontal headache. He was not constipated. He had very marked choreiform habits such as blinking, sniffing, and irregular movements of head and hands. He had a dry skin and much trouble with eczema between his fingers. He had frequent colds. He was lethargic and found it very difficult to learn. His hands felt numb in the mornings and he had frequent cramps in the muscles of his legs. His tonsils were slightly infected and he had two infected teeth. On Nov. 28th, 1927, his appendix was removed with adhesions. The ileum was kinked by a marked contraction in the lower leaf of mesentery supplying the ileum, about four inches from the cæcum. This was freed as described in Case 1. The walls of the ileum were thickened and of a rubbery consistency. The tonsils and infected teeth were removed.

Report on Case on Oct. 1st, 1928.—1. He has not had a bilious attack since the operation. 2. He has only had one slight headache, which disappeared overnight. 3. He has an excellent appetite. 4. He has had no eczema since and no colds. 5. He still has choreiform movements, but they are greatly diminished, and are steadily improving with time. 6. He finds it easier to learn. 7. Numbness occurs only occasionally, and he has fewer cramps in the legs.

CASE 3, a man of 41, complained of having had indigestion and constipation since childhood. At times any food caused discomfort after eating (burning feeling below the umbilicus) and he frequently vomited his meals shortly after taking them. He suffered with severe right frontal headache, especially during the winter, and most of the time he had a trembling, nervous sensation. Of late years he has always felt tired and heavy; work has been a drudge and his legs have at times felt too weak to carry him. His skin had a sallow brownish tinge and felt dry and burning. A few weeks before June 19th, 1928, he had slight cramp in the abdomen, below the umbilicus, centring to the right of the mid-line. In 1916 he consulted a prominent physician in Toronto and was given a very thorough examination. The diagnosis was "neurosis of the stomach" and treatment was instituted. No improvement was noticed, although the instructions were closely followed.

On June 19th, 1928, I operated and found an appendix which showed evidence of having had inflammatory attacks and was firmly adherent to the lower side of the mesentery three to five inches from the ileo-cæcal juncture. It caused a marked kinking of the ileum at this point. The ileum distal to the kinking and extending to the cæcum was congested and thickened, and had the rubbery feeling noticed in other cases. The appendix was removed and the kink released by cutting across the thickened fibrous leaf of the mesentery involved. A few bands of adhesions of

the upper cæcum and ascending colon were also freed. The patient felt and looked very sick for ten days, and from then on he steadily improved.

Report on Case on Oct. 7th, 1928.—1. Since his operation he has been able to eat any ordinary food without the least discomfort. 2. He has a good appetite and has gained 10 lb. in weight. 3. His skin has lost the dry, burnt feeling and is moist and soft. He has lost the sallow tint and the heavy depressed appearance. 4. The tired feeling in his legs is gradually disappearing. 5. He does not feel or look nervous. 6. He has had no headache. 7. He is not constipated. To use his own expression, "I have never felt like this before."

CASE 4, a man aged 51, had symptoms similar to those described in Cases 1, 2, and 3, except that for the two days before his operation he was unable to get his bowels to evacuate and had very severe cramps. At operation I found a subacute appendix surrounded by adhesions which continued along the mesentery of the ileum and bridged across to the upper part of the sigmoid colon, where they left a ring of about one and a half inches in diameter. Passing through this ring was a much distended loop of descending and sigmoid colon about two feet in length, and also a loop of distended, thickened ileum two or three feet in length. I believe these loops had been in this position for some time, but owing to the increased congestion caused by the subacute attack of appendicitis a complete obstruction resulted. The thickened contracted lower leaf of the mesentery was freed by cutting for a distance of about eight inches—that is from the appendix to the sigmoid colon—and in this way the obstruction of the colon and ileum were released.

The convalescence of this patient was slow. At the end of ten days the abdominal suture began to give way and pus exuded from the wound. Finally, the whole wound gaped down to the peritoneum. Gradually the patient's condition improved and the wound was resutured and united well. The patient was discharged from hospital on Oct. 22nd, 1927. I saw him last in July, 1928, pitching hay in the mow. He claimed that he felt better than he had for years. He had a good appetite and was able to eat ordinary food without discomfort. He was not constipated. He had gained considerable weight and now had a cheerful outlook on life.

FIG. 1.

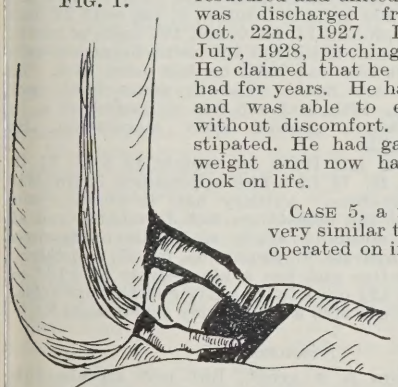


Diagram showing area affected.

CASE 5, a man aged 55, was very similar to Case 4. He was operated on in November, 1927, and presented the most extensive formation of scar tissue I have seen, resulting from what I believe were recurrent attacks of appendicitis.

CASE 6, a girl of 16, had signs and symptoms of acute appendicitis. She gave a history of recurrent similar attacks, but had felt well in the intervals. On June 28th, 1928, an operation was performed and an acutely inflamed appendix with a bulbous end was removed. A dense scar about one-half by one-quarter of an inch was situated on the lower leaf of the mesentery of the ileum about two inches from the cæcum. The ileum was normal. I mention this case because it illustrates the beginning of the thickened contracted mesenteric leaf referred to above.

Grouping of Cases.

I have selected these six cases as representative of the series of 28 cases I have observed, and they conveniently fall into three groups.

Group 1.—Case 6 illustrates a number in which the cicatrisation of the mesentery has just begun and has not interfered with the circulation of the mesentery and the ileum. In these cases no symptoms other than those of appendicitis were produced.

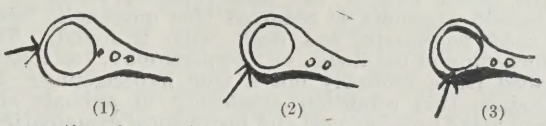
Group 2.—Cases 1, 2, and 3 are representative of those where the formation of scar tissue in the mesentery has caused a mechanical interference to the circulation of the mesentery and the distal portion of the ileum, but has caused no mechanical interference with the passage of fæces. In these cases we find superimposed upon the symptoms and signs of appendicitis other symptoms and signs which are always present. These cases formed the largest group of the series.

Group 3.—Cases 4 and 5 illustrate a group most advanced in the formation of scar tissue. In this group signs and symptoms of intestinal obstruction were superimposed on the signs and symptoms found in Groups 1 and 2.

Theory of the Causation of Hypertrophy of the Ileum beyond the Kink and of the Signs and Symptoms.

The ileo-colic artery and vein convey blood to and from the distal portion of the ileum and the first portion of the colon. They anastomose with the right colic artery and vein. The cicatrisation of the lower leaf of the mesentery of the ileum, caused by recurrent

FIG. 2.



(1) (2) (3)

Cross section of mesentery and ileum. (1) Normal; (2) scarred mesentery; (3) more advanced. Notice the shortening and thickening of the lower leaf of peritoneum of the mesentery. It also illustrates the rotation of the ileum on its longitudinal axis. The arrows indicate the same point on the ileum.

attacks of inflammation, interferes with the return flow of venous blood from the ileum beyond the kinking and therefore produces a chronic congestion in the walls of this portion of the ileum. This congestion, persisting over a period of time, causes an hypertrophy of the tissues of the ileum just as a stricture round a finger will cause an hypertrophy of the distal portion of the finger. The free anastomosis of the ileo-colic vein with the right colic vein enables the venous blood of the first part of the large bowel (but not of the ileum) to escape without causing congestion and hypertrophy of the first portion of the colon.

This interference with the circulation of the ileum causes a devitalisation of the cells of its affected portion, the degree of devitalisation depending upon the amount of interference with the circulation. The devitalisation of the cells of the ileum may produce the toxin which is absorbed by the blood stream or may upset the selective absorptive power of the diseased portion of the ileum so that it now absorbs toxic substances as well as the normal products of digestion. These toxic substances in the blood stream then act upon the different types of tissue cells with which they come in contact and so produce the various symptoms. Thus I believe the constipation found in the cases of Groups 1 and 2 is not mechanical, for the ileum proximal to the kinking is never packed with fæces. I think the constipation is due to the lethargic state of the nerves and muscles of the colon, which results from the action of the toxic substances.

The Operation.

After removal of the appendix by the right rectus incision the ileum is examined for some distance back from the cæcum. If a band of cicatricial tissue is found in the lower leaf of the mesentery this is cut completely through, great care being taken to cut every strand of scar tissue, but not to injure the subperitoneal structures of the mesentery. This removes the cause of the interference with the circulation of the ileum and the ileal kink. Nothing further was done to the mesentery, and every case healed by first intention without any signs of infection, except Case 4, and he had no signs of intraperitoneal infection.

Comment.

My reasons for regarding cicatrisation of the mesentery as the cause of the ileal kink are :—

(1) Case 2, as well as a few others in the series, had evidence of recurrent attacks of inflammation in the

appendix, but was not constipated. Nevertheless he had a marked ileal kink and scarred mesentery.

(2) Constipation, which was present in the majority of cases, was cured or greatly diminished by removing the appendix and freeing the band causing the hypertrophy. Had the "first and last kink" and not the diseased ileum been the cause of the constipation, then no relief, much less a cure, would have resulted from freeing the cicatrised band of mesentery only.

(3) The contracted scarred mesentery of the ileum, as shown in Figs. 1 and 2, in every case of the series produced the kink by pulling the ileum down, rather than by pulling it up to form an internal lateral ligament to support the cæcum, as described by Sir Arbuthnot Lane.

Failure to separate this mesenteric band when it is present is, I believe, a frequent reason why patients do not feel any better after the removal of a diseased appendix. Sometimes it is not prudent to search for this band, but, if the case permits, whenever a diseased appendix is removed this mesenteric band should be sought and dealt with if found. The thickening of the ileum, or "hypertrophy," as I have called it, is probably not a true hypertrophy. To produce this condition artificially in animals and then make physiological and histological examinations might be an interesting field for research.

Clinical and Laboratory Notes.

A NOTE ON CRETINISM, DIABETES, AND PREGNANCY.

By L. J. Witts, M.D. Manch., M.R.C.P. Lond.,
ASSISTANT TO THE MEDICAL UNIT, LONDON HOSPITAL.

THE interesting features of the following case are the occurrence of hypothyroidism in mother and daughter, and the association of cretinism, diabetes, and pregnancy in the daughter.

The mother was seen to be suffering from myxœdema when she visited the hospital with her daughter this year. She was 56 years old, and had had eight children, of whom four survive. The youngest, who later developed cretinism, was born when she was 33. At 37 the catamenia, having previously been regular, ceased. At 50 she began to get stout, felt that her memory was getting worse, and had a vague fear of something that was going to happen. She was afraid to go out by herself. The skin of the hands and feet became dry and cracked, her hair began to fall, she readily felt the cold, and the bowels were very constipated. During the last year all symptoms had become worse. She was a short, stout woman, with a pale yellow complexion and a skin that was dry and inclined to be scaly, especially on the hands and feet. The hair of the head was fine and dry, and the eyebrows thin, especially in their outer halves. The thyroid was not palpable and there were no supraclavicular pads. The only other abnormality was a mild secondary anæmia. She was treated with thyroid extract, commencing with grs. 5 a day, the dose being afterwards reduced to grs. 2. She responded well to treatment.

The daughter was admitted to hospital for menorrhagia in December, 1926, when she was 21 years old. Since 9 years of age she had been noticeably pale, with feelings of faintness and breathlessness on exertion. The catamenia commenced at the age of 19. The periods occurred every three months and lasted one to three weeks; there was some pain and the loss was excessive. There was no diabetes in the family. She was small and childlike, measuring only 4 ft. 6½ in. Her eyes and expression were dull, but she was fairly intelligent and had done book-keeping in an insurance office. She did not go out much, but read a great deal, being especially fond of Dickens and Rider Haggard. The face was broad and expressionless, the bridge of the nose poorly formed, the alæ broad, and the lips thick. The hair was short, dry, straight, and thin, and the eyebrows scanty. The complexion and the mucous membranes were pale, and the hands broad and spade-like. The skin of the whole body was dry and rough, with a thickening of the subcutaneous tissues, though not to the degree usually found in adult myxœdema. There was no pubic or axillary hair, but the breasts were well developed and the uterus was of normal size. The thyroid was not palpable. There was a severe anæmia. The Wassermann reaction in the blood was negative.

She was treated with thyroid extract, grs. 3 daily, and made steady and remarkable improvement. Her weight fell from 5 st. 6 lb. to 4 st. 11 lb., the skin became softer in texture, and the hair softer and curly. Her features became more finely chiselled, her eyes brighter, and she was much more intelligent and active in every way. Her hands became more shapely. She was discharged on the same dose of thyroid extract.

There was little growth in height, and in these last two years she has gained only 1 in. The periods occurred regularly every month, lasted about five days, and were normal in quantity. Her mental condition changed greatly. She went out to entertainments and dances and enjoyed being with members of the opposite sex. She continued very well on thyroid extract, grs. 3 daily, until September, 1927, when she was readmitted to hospital with a history of six weeks' thirst, polyuria, and weakness. The urine contained much sugar, and the blood-sugar was 0·22 per cent. She responded well to diabetic treatment and was discharged with normal blood-sugar and sugar-free urine without insulin, on a diet of carbohydrate 56, protein 53, fat 92, and calories 1264. The weight was 5 st. 11 lb.; the dose of thyroid extract was reduced to gr. 1 daily. She did not adhere strictly to the diet and often had sugar in the urine, though she became sugar-free on the same régime on readmission to hospital in April, 1928. Glycosuria and ketonuria recurred soon after discharge, and in May 10 units of insulin twice a day were prescribed with the same diet. In June she was sugar-free, but reported that she had had no menstrual period for three months. Her interest in the opposite sex had confessedly been an active one, and she was pregnant. She remained sugar-free until August when, owing to an oversight, no insulin was prescribed, though the thyroid extract was continued. On Sept. 12th she was readmitted to hospital in coma, having taken no insulin for six weeks. The blood-sugar was 0·44 per cent. In the first 24 hours she received 200 g. of carbohydrate and 200 units of insulin; in the next 24 hours carbohydrate 115, protein 14, fat 6, and 100 units of insulin. She came out of coma, the blood and urine became normal, and in a few days she was back on her usual diet. The fœtal heart was not heard. Labour commenced spontaneously on Sept. 13th, and she was delivered of a 7–8 months fœtus which showed early maceration. Her breasts secreted milk.

At present (Nov. 1st, 1928) her weight is 5 st. 11 lb. and her height 4 ft. 7½ in. The appearance is infantile but not myxœdematous. Axillary hair is absent, pubic hair is scanty, but the breasts are well developed, and she has menstruated normally again since the confinement. On a diet of carbohydrate 60, protein 55, fat 87, and calories 1243, she is sugar-free and has a blood-sugar of 0·133 per cent., with insulin 12½ units twice a day and thyroid extract grs. 2 daily. There is still a moderately severe anæmia.

Discussion.

Hypothyroidism is a great, but not an absolute, bar to pregnancy. Howard, in his study of 100 cases of myxœdema, found one in which pregnancy occurred soon after the onset of the disease and another in which it occurred at its height. The occurrence of pregnancy in this girl, who suffered also from another disease inimical to pregnancy (diabetes), is evidence of the completeness of substitution therapy. Her mother had no signs of myxœdema at the time she was born, but the early menopause four years later, at the age of 37, is suggestive. Gordon Paterson recorded the case of a woman who gave birth to cretinous children in her first two pregnancies. The first child recovered with thyroid treatment, the second died soon after birth; neither the woman nor her husband showed signs of hypothyroidism. In her third pregnancy she was treated with thyroid extract and gave birth to a healthy child. The inheritance of hypothyroidism is well established. MacIlwaine reported the case of a woman in whom myxœdema followed an attack of Graves's disease. She subsequently became pregnant. The child was normal at birth, but a year later cretinism set in after an attack of diarrhœa. Mother and child responded well to thyroid treatment. There are many examples of hypothyroidism in children of the same family. The Clinical Society's report contains several instances of myxœdema in sisters. Herrman saw two families in each of which three of the children suffered from sporadic cretinism. In both families not only were there other norma

hildren, but normal children were born between the bnormal. Herrman also noted cretinism in one of wins. Howard found that 8 out of 68 patients with ıyxœdema 11·8 per cent. gave a family history of ıyxœdema. Hun and Prudden, who reviewed 150 ases of myxœdema reported in the literature, found hat in 8 per cent. there was direct inheritance of the isease, and that in about an equal number of cases he disease occurred among brothers and sisters.

Hypothyroidism and Diabetes.

A priori one would expect the association of hypohyroidism and diabetes to be rare, for sugar tolerance s increased in hypothyroidism. Eaves and Croll ave recently published their post-mortem findings ı a cretin who died untreated at the age of 14½. 'he pancreas, though small, was proportional in ize to the body. They made a quantitative estimaion of the amount of islet tissue; normally this orms about 2 per cent. of the pancreas, but in the retin it was 3·54 per cent. This observation is upported by experiments on animals, in which the mount of islet tissue is increased after thyroidctomy. In thyroidectomised animals the amount f sugar in the fasting blood is diminished and the lood-sugar curve runs at a lower level than before he operation. The hyperglycæmia produced by a iven dose of adrenalin is less and the hypoglycæmia roduced by a given dose of insulin is greater. The oexistence of typical adult myxœdema and diabetes s still uncommon enough to be worthy of report. Nevertheless, conditions in the adult are not so clearut as in the cretin or the experimental animal. Gardiner-Hill, Brett, and Smith found the fasting level f blood-sugar within normal limits in most myxœdema ases. The blood-sugar curve was higher and more rolonged than in normal persons. Glycosuria was are, and he suggested that the renal threshold was aised. Treatment with thyroid extract did not aise the fasting level of blood-sugar in myxœdeıatous patients; its general effect was to lower he blood-sugar and to quicken the curve. I have ometimes suspected an element of hypothyroidism ı obese diabetic women at or after the menoıause and have seen patients greatly improved on reatment by undernutrition and thyroid extract—ı improvement not confined to the diabetes.

However this may be, there is no doubt of the arity of diabetes in juvenile myxœdema or cretinism. have found accounts of only five cases. Gordon quoted by Strasser) saw diabetes in two brothers, ged 3 and 4½, who were cretins; he believed that he diabetes was favourably influenced by thyroid reatment. Strasser's patient developed cretinism in nfancy and did not come under thyroid treatment ntil he was 7. He made great improvement, but year later diabetes set in and thyroid treatment vas discontinued, as it seemed to accelerate the maciation. He died 18 months later. Apert's atient was a cretinous dwarf, who measured only ·45 metres. Growth had continued up to the hirty-sixth year. At the time of Apert's paper ıe was 66 and had had diabetes for at least four ears; the urine contained about 70 g. of sugar a ay. No observations were made on the effect of hyroid treatment. Wilder's patient showed signs f diabetes at the age of 15 months. He was placed ı a strict diet which, after six months, was relaxed ithout the return of glycosuria. Hypothyroidism ppeared at the age of 3 and thyroid treatment was egun; it was discontinued on account of the return f glycosuria. During thyroid treatment growth was esumed, but after its discontinuance growth again topped and the tolerance improved so that the child ould eat anything without excreting sugar. Subsequent administration of thyroid once more caused rowth to be resumed, but only at the cost of a severe iabetes, the child continuing to excrete sugar on very low diet. It is clear that simultaneous diabetes nd cretinism led to a therapeutic impasse in preinsulin days. There are several reasons for this. he administration of thyroid extract not only raises the basal metabolism, from perhaps minus 40 per cent. to normal, but it also replaces vegetation by activity and growth, both of which mean an increased caloric requirement. The sexual system is stimulated to maturation. In Joslin's curves showing the age of onset of diabetes the peaks are at puberty and the menopause, the periods of evolution and involution of this system. Juvenile diabetes was formerly almost always fatal because of the demands made by activity, growth, and puberty. In the cretin treated with thyroid extract they are especially urgent. Nowadays, however, insulin allows us to satisfy the demands of the juvenile diabetic and enables these children to grow to maturity. The case I have reported shows that this is true also of the diabetic cretin who is receiving thyroid, and that the two forms of substitution therapy are not incompatible.

The pharmacological antagonism of thyroxin and insulin was demonstrated in the animal experiments of Burn and Marks, who found that thyroid feeding decreased the hypoglycæmic reaction to insulin. Apparently the liver became more sensitive, and therefore glycogenolysis more readily occurred when insulin was injected. I do not know that these results are absolutely comparable with clinical practice. Very large doses of thyroid were used, one animal losing nearly one-third of its weight in 20 days. From a study of the literature it appears that, although the sugar tolerance of normal subjects is fairly easily disturbed by thyroid extract, this is not likely to happen in the treatment of definite hypothyroidism. Thus the work of Gardiner-Hill, Brett, and Smith indicates that thyroid treatment does not have a harmful influence on the sugar tolerance of adult myxœdema. "Bottman found that 55 per cent. of patients with maladies other than myxœdema developed a temporary glycosuria under the experimental administration of thyroid extract. On the other hand, Scholtz, among 100 cases of cretinism, was unable to produce by thyroid administration a single case of even alimentary glycosuria" (Howard). My own experience is that thyroid extract may sometimes be of value in the treatment of obesity and *diabète gras* and, as long as symptoms of thyroid intoxication are avoided, the danger of producing or aggravating a glycosuria is not greatly to be feared.

The subject of diabetes and pregnancy has been so recently reviewed by Parsons and by Joslin that there is no need to add much on this point. "Diabetes is more menacing to pregnancy than pregnancy is to diabetes." Conception is infrequent on account of amenorrhœa, of vulvitis, vaginitis, and cervicitis, and of voluntary prevention. Before insulin at least 50 per cent. of pregnancies ended in miscarriages or stillbirths, and the mother ran a grave risk of coma at delivery, puerperal infection, or aggravation of the diabetes. Even with insulin the danger is great. The metabolism is very delicately balanced, and supervision must be close to ensure a normal delivery.

I wish to thank Prof. A. W. M. Ellis for permission to publish this case.

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A SERIES OF MONSTERS.

By E. JOAN PARRY, M.R.C.S. Eng.

THE following case appears worthy of record.

A woman, aged 37, was confined in August, 1925; the child was stillborn, an anencephalic monster with a spina bifida. She was confined again in July, 1926. This was a difficult labour and the fœtal skull had to be perforated. The fœtus had a marked hydrocephalus with a hare-lip and cleft-palate. At the last confinement in July, 1927, she had twins; one was mummified, about 1 lb. in weight, and born in thick greenish fluid surrounded by the membranes. The other baby (girl) appeared perfectly normal but was premature and weighed only 3¼ lb. It developed normally.

Before her marriage this woman had four illegitimate children, all of whom were perfectly healthy. These were the only three children by the husband. In each case for the last two months of pregnancy she showed marked signs of toxæmia—œdema of legs, albuminuria. The father's blood gave a negative Wassermann.

Bristol.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ANÆSTHETICS.

AT a meeting of this Section held on Feb. 1st the chair was taken by Mr. ASHLEY S. DALY, President, and a paper was read by Dr. R. D. LAWRENCE on

POST-OPERATIVE ACIDOSIS.

He began by describing the mechanisms which keep the body in the alkaline balance essential for its activities. The reaction of a fluid, he said, depended ultimately upon the hydrogen- and hydroxyl-ions in it, and was formulated by the term "pH," a negative logarithmic expression of the number of free hydrogen-ions. The neutral pH was 7 and the normal pH of the blood was 7·4. In severe acidosis the blood might have a pH of 7, which meant four or five times as much acid as normal. The chief of the "buffer substances," which kept the blood alkaline at their own expense, was sodium bicarbonate—the "alkaline reserve" of the blood. The relation between the free carbonic acid and the sodium bicarbonate was a constant of 1 : 20. Any added foreign acid was at once combined with the bicarbonate reserve, and as that was reduced the free carbonic acid had to be reduced also to maintain the constant. This was brought about by over-breathing and increased excretion of carbon dioxide through the lungs. There were many other mechanisms to counteract any acid condition; the phosphates, the proteins, and the hæmoglobin all played their part, and excess of acid was got rid of in the urine, largely neutralised by ammonia. In ketosis there accumulated in the blood and urine certain substances, of which the best known was acetone and the most important hydroxyl-butyric and diacetic acids. These were products of incomplete oxidation of fats, and might appear in the urine without any lowering of the alkali reserve; they were excreted whenever insufficient carbohydrate was being burned and were probably an expression of lack of sugar and glycogen. They appeared in normal people under conditions of starvation.

The Production of Acidosis after Operation.

Inhalation anæsthesia definitely reduced the pH of the blood within 20 minutes of induction, causing a fall in alkaline reserve, though rarely of more than ten volumes per cent. Ketonuria was much less frequent and apparently secondary to the common, slight, real acidosis. Chloroform was the greatest offender; closed ether produced acetone bodies in the urine in 89 per cent. of cases, but open ether only in 26 per cent. Ketonuria and acidosis were not, however, unknown even after spinal and local anæsthesia. Novocaine had been found to produce a small decrease in the alkaline reserve—about 5 volumes per cent.—in half the cases examined, but these were practically all abdominal operations; the condition did not occur after operations on the extremities. Ketonuria followed shock or severe fractures, and was much more common in children, women, and nervous and anxious patients. Excitement and mental shock were important ætiological factors. The mechanism of its production was difficult to explain; the factors were complex and probably multiple. Certain facts had been definitely established.

Acidosis was produced by sleep because of the insensitiveness of the respiratory centre to the stimulus of carbon dioxide. In anæsthesia the centre was still more depressed; the respiratory centre of anæsthetised dogs was not stimulated by an increase of carbon dioxide. Another factor that led to acidosis was anoxæmia. Anæsthetics produced anoxæmia by causing a slight degree of asphyxia and by reducing the blood pressure and causing slight shock. They also depressed the metabolic function of the cells and reduced their consumption of oxygen. Post-operative acidosis, therefore, was probably caused largely by the depression of the respiratory centre and of the circulation, and the resulting condition of anoxæmia. Its occurrence in local anæsthesia, however, demanded another explanatory factor. Local and spinal anæsthetics, however, were not always free from shock—mental if not physical—and it was noticeable that minor operations on the extremities were not followed by acidosis. Ketosis was easier to explain than real acidosis. It depended on a temporary upset of carbohydrate metabolism, and all forms of inhalation anæsthesia raised the blood-sugar, sometimes causing glycosuria. This was because the glycogen store of the liver was rather quickly depleted by anæsthetics, and so the metabolism changed over from carbohydrate to protein and fat, and ketone bodies were produced. Protein metabolism meant further production of acids, which in its turn reduced the alkaline reserve. Insulin action was always defective in conditions of acidity. Adrenalin also disturbed the carbohydrate metabolism and raised the blood-sugar, and there was increased output of adrenalin in excitement, shock, and anxiety.

The Control of Acidosis.

It had long been known that the tendency to ketosis after operations could be stopped by giving plenty of carbohydrates. Neither these nor alkalies, however, prevented the slight fall in the alkaline reserve, which was most difficult to control. In normal individuals it was of no importance at all; it did not cause chronic symptoms or vomiting. It could not be prevented with certainty by any preparation of the patient, although the administration of glucose and insulin was the most likely method to succeed. If the patient had established ketosis or acidosis before the operation efforts should be made to protect him. Those who had acidosis without ketonuria were mostly chronic nephritics or sufferers from wasting diseases. They were difficult to recognise without chemical tests, but operative procedures were avoided on them for other reasons. If they must be subjected to operation the anæsthetic should be spinal or local if possible and they should be prepared by a moderate dose of sodium bicarbonate—e.g., eight drachms a day for a few days—and an abundant carbohydrate diet.

Those who had ketonuria without any real acidosis were both more common and more important. Most often acetone bodies were present in the urine without any real acidosis, but if they were present in large amount it might mean that the alkaline reserve was reduced. In these patients an operation, with the resulting increased ketosis, might lead to headache, nausea, vomiting, and depression, or even liver damage—especially if sepsis were present. A liver without its normal store of glycogen was much more sensitive to the toxic action of chloroform and ether. The presence of ketone bodies in the urine in such cases constituted a danger-signal which should not be ignored. Among non-diabetics pregnant women were especially liable to this danger, and children more

han adults. The significance of the ketone bodies lepended on their quantity. If only the nitroprusside est were positive, small amounts were present; a positive ferric chloride test meant serious if not langerous quantities. The operation should be postponed until the ketone bodies had been got rid of by a liberal carbohydrate diet, which usually took 24 or perhaps 48 hours. There was no point in giving insulin to the non-diabetic, as the sugar stimulated insulin production from his own pancreas. If the ketosis were severe and the patient very toxic the sugar might not provoke the adequate response, and in that case insulin should be given along with it. If the case were an emergency and the operation could not be postponed spinal or local anæsthesia should be used. Gas and oxygen with a minimum of ether was the next best, and chloroform should be avoided. Glucose must be got into the system as soon as possible—50 g. by mouth if the patient could take it—and rectal administration during and after the operation. If the degree of ketosis were not great this would be sufficient. If, however, the ferric chloride test were positive the situation was serious; 50 g. of glucose with abundance of saline should be given intravenously, together with 20 units of insulin, before the operation, followed up with rectal glucose. If the alkaline reserve were known to be low six or eight drachms of sodium bicarbonate should be added to the intravenous dose; not more, for overdosage had grave depressing results.

All operations tended to make diabetics worse, causing severe ketosis and acidosis, perhaps coma. As good a supply of glycogen in the liver as possible should be secured by giving them more carbohydrate than usual and considerable amounts of insulin. If, however, there was time to prepare them properly diabetics could go on the table as normal operative risks. It was as well in addition to give 20 units of insulin and an ounce or an ounce and a half of sugar an hour and a half before the operation. The best dose could only be established by a blood-sugar estimation, but if this were unobtainable in an emergency 20 units of insulin and 20 g. of sugar should be given before the operation and repeated four-hourly after it. If there were not much sugar in the urine, or it rapidly disappeared, the sugar-dose should be twice that of the insulin. In severe cases these doses might, of course, be quite inadequate. Diabetics did well under gas and oxygen and ether, but the spinal method was the better one for them.

Discussion.

Dr. P. J. CAMMIDGE suggested that Dr. Lawrence might have laid more stress on the ultimate cause of acidosis in the chemical composition of the tissues rather than of the blood. The cells of the body were like chemical batteries, and alteration in the concentration of the chemicals in them meant alteration in the current. There might be an alteration in the alkali reserve without symptoms, or symptoms might appear without any alteration in the reserve. Another factor was variation in the amount of water retained by the tissues. Alteration of the proportion of the electrolytes in the cells meant alteration in their volume of water. The causes of acidosis might be divided into distinct groups: (1) anhydræmia, as produced by vomiting, diarrhœa, and polyuria; (2) over-production of the normal acid products in the body—lactic, phosphoric, sulphuric—as in nephritics; (3) removal of the alkaline bases of the cells—this also acted in nephritics, because the damaged kidney could not produce the ammonia required to neutralise these acids and so had to use bases; (4) the formation of abnormal acids, as in diabetes; and (5) changes in the osmotic pressure between cells and plasma. Whether these changes produced acidosis or alkalosis depended on how they were brought about. It did not necessarily follow that because a patient had the symptoms of acidosis that he had actual acidosis; he might have alkalosis, which was not at all rare after operations and was recognised by the absence of chlorides from the urine. If the chlorides were low it was advisable to give salt intravenously with glucose. It was important to recognise the child who suffered from cyclical vomiting and to give carbohydrate before any operation. These children had inherited, as a Mendelian dominant, a liver that could not store glycogen normally. Oatmeal cooked for five or six hours was preferable to glucose, especially for children; it contained a molecule that the liver utilised more effectively than any other.

Prof. E. C. DODDS said that in his experience post-operative acidosis was very rare indeed, and asked for a definition of it from the anæsthetist's point of view, as the clinical definition was most important. He asked why it was that women in childbirth stood chloroform so well.

Mr. F. E. SHIPWAY said that anæsthetists would all agree that this was a laboratory problem and very rare in practice. Chloroform was not good for pregnant women who were having surgical operations, but the anæsthesia used in childbirth was very light. Only deep chloroform anæsthesia caused acidosis.

Dr. KINGSTON BARTON pointed out that the woman in labour was breathing deeply and rapidly, and so could take chloroform with impunity.

Mr. ZACHARY COPE described a case of post-operative acidosis clinically, but said that he had not seen one since chloroform had been abandoned for abdominal operations.

Mr. C. H. HUGHES said that all surgical cases should have their urine examined for ketone bodies.

Mr. R. E. APPERLY recalled the first cases of delayed chloroform poisoning described from Paddington Green Children's Hospital. Most of them had had a very short anæsthetic. His experiments on animals had confirmed the suggestion that it was short, deep chloroform administration that was dangerous.

Dr. J. BLOMFIELD pointed out that some of the early cases at Great Ormond-street had had very short ethyl chloride anæsthesia. The condition was not seen now that chloroform was little used.

The PRESIDENT said that the only fatal case he had seen had been after a very short anæsthetic, and asked how to treat a patient with cyclical vomiting at an emergency operation.

Reply.

Dr. LAWRENCE said that if there was an hour to spare the child should have an ounce of glucose by the mouth; if there was no time intravenous glucose should be given during the operation, and if the child were very toxic ten units of insulin could be added. Acidosis had very little to do with grave post-operative toxæmia, the toxins of which were quite different, although always associated with ketone bodies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

A MEETING of this Society took place at the House of the Medical Society of London on Jan. 25th, Dr. DAVID NABARRO occupying the chair. The subject of discussion was the

TREATMENT OF GENERAL PARALYSIS OF THE INSANE BY PYROTHERAPY.

Dr. W. D. NICOL opened the debate. He said that at the Horton Mental Hospital the patients were certified before being admitted. Usually the diagnosis of general paralysis did not present many difficulties. A matter of great importance was the physical condition of the patient, since the severe malarial attack was liable to test his strength considerably. While early cases showed most favourable results, advanced cases also could safely be treated by this method, provided that physical examination revealed no definite organic disease, especially in the circulatory and renal systems. Septic foci in the teeth and the alimentary system should be dealt with before commencing the malaria treatment. At Horton, by arrangement with the Ministry of Health and the London County Council, a special block was set aside for treatment by malaria. The stage of

development of the parasite must be sufficiently advanced, so that when the mosquito bit it will be effective. The incubation period varied from 10 to 14 days, and it was important that no untoward event should happen during that time. The patient was put on a four-hourly temperature chart from the eighth day of the infection onwards; and routine blood examination dated from the first febrile manifestation. During the initial stage the symptoms resembled those in a commencing attack of typhoid fever, though the temperature was more "spiky" in character. In the developed stage the parasites could easily be seen in films of the blood, and during the first few days their numbers increased.

Dr. Nicol regarded as the most important procedure in the treatment the temporary interruption of the course of the fever, since this was one of the biggest factors in reducing mortality from induced malaria. The indications for this temporary interruption were a heavy parasite count, persistent vomiting, fainting, cyanosis, and so forth. Ten to 12 paroxysms of fever should be aimed at, after which the attack could be terminated by quinine, small doses being just as effective for this purpose as large ones. After treatment, as the patient was left anæmic he should be given an iron tonic. As to results, it was found that about one-third of the patients were so improved physically and mentally that they could be discharged; one-third were improved physically, but not sufficient mental change was apparent to justify discharge; while the remaining third showed no change for the better, but progressive deterioration. The sooner general paralysis of the insane was diagnosed the better chance had this treatment of bringing about recovery. In mental hospitals, where cases were not admitted until certified, there was necessarily delay in instituting the treatment, and this was regrettable.

T.A.B. Vaccine.

Dr. J. M. MACKENZIE said that many general paralytics suffered from chronic sepsis in addition to syphilis, and the sepsis might be responsible for at least some of the more acute symptoms, such as restless motor excitement with destructiveness. Glaessner had found that cases of enteric fever showed a striking immunity to influenza, and for this and other reasons it was decided at Rubery Hill Mental Hospital, Birmingham, to try the effect of T.A.B. vaccine. Injections with a B. & W. product were given intravenously each day for ten days, starting with a dose of 300 million total organisms, gradually increased to 6000 millions. After a six-weeks' interval a second course of ten injections was given, this time commencing with 1500 and rising to 20,000 millions. During the interval four injections of 0·45 g. of N.A.B. were administered. Six weeks later, after four more injections of 0·45 g. N.A.B., a third course of T.A.B. similar to the second course was given in some cases. Half an hour after each injection a severe rigor began, the peak being reached in two hours. Herpes occurred on the fifth day. Usually the temperature dropped to normal within 12 hours of the injection. If that drop did not occur a septic focus should be searched for. The best results were obtained in grandiose and restless cases. Usually there was a return of the excitement after pyrogenic treatment had ceased, but the tendency to do impulsive acts was replaced, in the majority of the patients, by the ability to do useful work under supervision; in a few initiative returned. During each course of injections there occurred a fall in the body-weight, but it was well regained in the intervals, and muscle tone was improved. There seemed to be no direct connexion between serological changes in the blood and change in the mental and physical condition of the patient. These T.A.B. vaccine injections, however, caused remission in the course of general paralysis, and in the series under Dr. Mackenzie's observation this remission extended in some patients to two and a half years, but was as short as four months in a few. Incidentally, the treatment conferred a high degree of immunity to the typhoid group of infections, provided a six-weeks' interval elapsed between each course of fever-therapy, to guard against possible exhaustion of the antibody-producing mechanisms.

With regard to end-results, by this treatment life was prolonged; during the remission the patients were quiet and amenable, and might be able to do useful work. The question of their discharge from the mental hospital was always a difficult one, and much depended on what sort of home life they were likely to have.

Discussion.

The CHAIRMAN referred to cases at Great Ormond-street Hospital for Sick Children, showing symptoms of what was termed general paralysis of the insane, though the condition in children was difficult to diagnose owing to the absence of grandiose symptoms. Fifteen cases had had malaria treatment, all except one being congenital syphilitics. Half the number were treated by mosquito bite, the others by the injection of blood from malaria cases; the incubation period varied according to which method was employed. In children the temperature shot up at once after the injection, in contrast with the gradual rise in adults mentioned by Dr. Nicol. Dr. Nabarro was not very satisfied with the general effect of this treatment in children.

Dr. WANSEY BAYLY said that many observers regarded it as dangerous to give this treatment to advanced cases; his own view was that any risk was justifiable in an established case, since it was not of tragic moment even if death happened to be hastened.

Dr. H. M. HANSCHELL thought that every patient with general paralysis of the insane should be treated with malaria, certainly every one whose cerebro-spinal fluid was Wassermann positive. He had used T.A.B. in the way described for disseminated sclerosis eight years previously, and during the last two years for latent tertiary cases of syphilis, and had thus obtained a negative Wassermann.

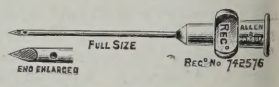
Dr. BUCKLEY SHARPE said that in children it was very difficult to be certain whether relapse had occurred, because they were so liable to chills and incidental illnesses.

Dr. NICOL and Dr. MACKENZIE briefly replied.

New Inventions.

NEW NEEDLE FOR THE INJECTION OF VARICOSE VEINS.

THE two main essentials for the successful treatment of varicose veins by the injection method are that the solution shall be brought into as close contact with the endothelium as possible and at its highest concentration. This needle has been designed for the purpose of meeting these desiderata by the direction given to the flow as it leaves the eye, which being laterally placed, permits of the solution being injected at an obtuse angle to the wall of the vein. There is less danger of the solution being injected into the wall of the vein instead of into the lumen, owing to the very short bevel and the distance from it to the eye of the needle. With an ordinary hypodermic needle this is liable to happen, especially so with a long-pointed bevel. Owing to the position of the eye, there is less likelihood of it being blocked as it penetrates the tissues to enter the vein. Finally, any direction may be given to the flow by axial rotation of the syringe. The lettering REGD. stamped on the mount should be noted, as it indicates the direction of the eye in relation to the walls of the vein, so that it is possible to make a complete ring around the wall with the sclerosing solution. This method will be found useful in treating very dilated veins. The needles are made by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, W. 1.



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Reviews and Notices of Books.

THE ART OF SURGERY.

By H. S. SOUTTAR, D.M., M.Ch. Oxf., F.R.C.S. Eng., Surgeon, London Hospital. London: William Heinemann (Medical Books) Ltd. 1929. Pp. 624. 30*s*.

THIS book is written with the avowed object of lightening the student's labour by omitting what is not essential and by describing very fully what is fundamental. It bears little resemblance to the conventional text-book, though the general arrangement of the contents follows the usual pattern, commencing with inflammation, suppuration, tuberculosis, syphilis, gangrene, tumours, hæmorrhage, and other general surgical subjects, and proceeding to regional surgery. Apart from its arrangement the text does not resemble that of any ordinary text-book; there is a greater continuity in the method of writing, which makes for pleasant reading and there does not seem to be such a large and forbidding collection of facts to be absorbed by the reader. This effect has not been obtained by the omission of any material facts, but partly by the skill of the writer and partly by his resolve to avoid too much detail. Many text-books consist of a blend of the author's personal experience of surgery with facts obtained from other text-books or original writings, and the younger the author the more do the latter tend to predominate. Mr. Souttar has relied entirely on his own knowledge and the fruits of his wide experience. Results have justified this method; those facts which have seemed to Mr. Souttar to be of great importance are undoubtedly those which should first be absorbed by the student, who can later supplement this fundamental knowledge from the study of more advanced works or special monographs. A possible danger in a text-book by one author is the statement of only one point of view on a controversial subject, but on the whole this pitfall has been avoided by Mr. Souttar with excellent judgment. An exception is in the section on paralytic ileus and peritonitis, where Mr. Souttar omits to mention that there is a definite school of thought favouring absolute rest to the intestines. He describes only the vigorous treatment pursued by the opposing school. Similarly, his enthusiasm for gastro-enterostomy in the treatment of chronic gastric ulcer is not universally shared, while his assumption that the hopes formerly held as to the value of medical treatment have now been abandoned is certainly not in accordance with modern views.

It is difficult to select any chapter for special comment since the book is remarkably uniform in aim and value. Even to those subjects in which his previous contributions to surgical literature show him to be specially interested, Mr. Souttar gives only their just proportion of space. The section on fractures is typical. The writer of a surgical text-book is always hampered by tradition when he writes on this subject since he feels it to be his duty to deal minutely with fractures which rarely if ever occur and splints and appliances which are of historical interest only. Mr. Souttar has broken away from the traditional method, for he discusses only those fractures of each bone which are common, giving the physical signs and the points specially to be noticed. He then describes a method of treatment which has given good results in his hands and should give equally good results if proper care is taken in all cases. The number of splints recommended is small, but most surgeons will agree that it is possible to treat most fractures with those mentioned, and it is indisputable that it is better for the student to understand thoroughly the way to apply a small number of splints than to have a fragmentary knowledge of many. There is certainly no ground here for the common complaint that the chapter on fractures is the most boring part in a surgical text-book.

As would be expected, the chapters on injuries to nerves, cerebral injuries and tumours, and diseases of the œsophagus are all excellent. Especially in the surgery of the nervous system it is difficult to separate the essentials necessary for the student from the refinements required by the expert, and Mr. Souttar has drawn the dividing line with skill. Although he is well known as an inventor of ingenious surgical instruments, he makes no more than a modest passing reference to some of his inventions, in accordance with his determination to avoid any details of operative surgery. He has thereby preserved the balance of his book, but we should have liked to see an illustration of his craniotome, an instrument of the greatest mechanical beauty and precision. There should also have been some reference to the useful metal frame devised by him for the support of splints used in fractures of the lower limb. This frame is much less cumbersome than the Balkan frame. The last chapter is devoted to a short but excellent description of local and spinal anæsthesia. The general principles are stated clearly and their application in several situations fully explained. As the author points out, this method of anæsthesia is limited only by the skill and anatomical knowledge of any surgeon who has thoroughly grasped the general principles. There are two useful appendices, one concerned with the measurements of the lower limb and the mechanics of apparent lengthening and shortening, always a confusing subject, and the other with the use of radium.

The book is most attractively produced. It is a moderately large and pleasant volume which is not too heavy to hold for a long period; it stays open easily and the pages lie flat; the paper is good and not highly glazed, and the printing is from a sound type and easy to read. A conspicuous feature is the very wide margin on the outer side of each page; this has not only a decorative effect, but it has also the more important function of providing space for sub-titles and illustrations which look casual, but are original in style and peculiarly apposite to the text. They are reproduced from drawings which are admirably chosen. No explanatory legends are required, for each drawing is accurately placed next to the paragraph which it illuminates. Mr. Souttar's ideal was to provide a thumb-nail sketch for each paragraph capable of being illustrated. He has already gone far towards reaching this end and we look forward in each succeeding edition to seeing interesting sketches in the still empty margins. We have no doubts as to the success of this production.

BACTERIOLOGY.

Recent Advances in Bacteriology and the Study of the Infections. By J. HENRY DIBLE, M.B. Glasg., M.R.C.P., Professor of Pathology and Bacteriology in the Welsh National School of Medicine; late Professor of Pathology in the University of London. London: J. and A. Churchill. 1929. Pp. 363. 12*s*. 6*d*.

IT is the misfortune of bacteriology that it has been chiefly studied by medical men in its relation to diseases, especially those of human beings. It has thus been very much an applied science and has suffered in consequence. In recent years, however, there has been a greater tendency to study the organism for its own sake and not merely for its effects upon a host; bacteriology has, in fact, developed a definitely academic side. This in itself is satisfactory, but it does not lighten the work of the medical student, who has not only to keep himself abreast of the increasing knowledge of the influence of bacteria in disease, but is also expected to have some idea of the highly complicated problems of pure bacteriology. And who is to tell him how much of this academic knowledge it is necessary for him to acquire? Prof. Dible has attacked the problem with success, and has written a book which should have a wide appeal not only to students and medical practitioners who are not especially versed in bacteriology, but also to those whose knowledge is more intimate. The book is divided into 27 chapters dealing with different aspects of the subject. Some of these are

related to one another, but the arrangement seems more or less haphazard; the pneumococci, for example, are sandwiched between measles and tularæmia and the spirochætal infections. Smooth progression from chapter to chapter is, of course, impossible in a work of this kind.

One of the earlier chapters, that on the streptococcus problem, is probably the best in the book; it deals in the most comprehensive way with this important subject. The author can scarcely be blamed if the next chapter on bacterial variations is not quite so clear and good; he has done all that is possible in the present confused state of roughs and smooths, and O's and H's. An excellent chapter on the bacteriophage is followed by two others, we rejoice to see, on experimental epidemiology, and Calmette and B.C.G. The next three chapters are devoted to filterable viruses, and the most important examples of these are well surveyed, though perhaps the treatment of the infective theory of malignant disease leave something to be desired. Other chapters deal with Rickettsia bodies, measles, pneumococci, spirochætal infections, local immunity, diphtheria, and anaerobic organisms. The book is well printed and produced, but the table on pages 2 and 3 is far from easy to read.

To write single-handed a review of recent work on bacteriology is no easy task, but Prof. Dible has succeeded admirably. He has surveyed the ground with thoroughness, and has exercised excellent judgment in the presentation of conflicting views. His book will not be the least popular member of this excellent series.

THE MOTOR MECHANISM OF PLANTS.

By Sir J. C. BOSE. London: Longmans, Green and Co., Ltd. 1928. Pp. 429. With 242 text-figures. 21*s*.

THE veteran founder of the Bose Research Institute in Calcutta gives in this volume a further series of his ingenious researches, showing that all plants respond to stimulation by movements of various kinds, similar in kind to, though less in degree than, those of the special "sensitive" kinds. He also deals with the existence of a mechanism for pumping sap which is subject to peristaltic movements akin to those of the mammalian bowel. Those people, especially who in their youth learnt botany and zoology as separate subjects and not as part of a considered scheme of training in biology, will be stirred by this account of the resemblances between the animal and the vegetable kingdom.

ELEMENTARY HÆMATOLOGY.

By W. E. COOKE, M.D., Director of the Pathological Department, Royal Infirmary, Wigan. London: Charles Griffin and Co., Ltd. 1928. Pp. 100. 7*s*. 6*d*.

As its name implies this book is concerned with the elementary facts of hæmatology, which are set out in a most satisfactory way; the language is lucid and the illustrations, most of which are from microphotographs, are clear and instructive. The descriptions of the various "blood" diseases are short but full enough to give a distinct picture; the section on the purpuras is remarkably good, and may be recommended to students of the blood who have passed the elementary stage. The book should prove popular with students and with practitioners who wish to keep at least within hailing distance of modern work.

GREEK THOUGHT.

By LÉON ROBIN. London: Kegan Paul, Trench, Trübner and Co. 1928. Pp. 409. 20*s*.

Prof. Léon Robin, Professor at the Faculty of Letters of the University of Paris, contributes the latest volume to the History of Civilisation, edited by Mr. C. K. Ogden, of which some 50 volumes are now in circulation. The volume has been translated from a revised and corrected French edition by Mr. M. R. Dobie.

From the medical point of view the evolution of the scientific spirit, as developed by the Greeks and exposed by Prof. Robin, has no very direct connexion with medicine, and when we say that in this long and closely written book the allusions to Hippocrates are but two or three in number and that those are brief and indirect, it will be seen that the work must not be confused with any history of the actual practice of medicine and surgery, as it existed in the four or five centuries preceding the Christian era or in the subsequent Roman period. Prof. Robin's learned pages, however, supply a general background to such a history, for he details the story of the great schools of Greek thought, and gives pictures of the philosophers connected with them, showing the connexion of their teaching with the external circumstances of the time.

An interesting foreword is supplied by Mr. Henri Berr, in which he points out that, although Prof. Robin presents philosophy and science in their constant relationship, he draws a distinction between the history of the one and that of the other which it is not easy to recognise. This reflection is founded upon Prof. Robin's statement that the history of philosophy is philosophy, and has for the philosopher an ever-living interest, while the history of science is not science, but only the dead part of scientific effort towards truth, the effort being forgotten when the end has been reached. This would imply that the history of science can only satisfy the curiosity of the erudite, and not, like the history of philosophy, the general and deep needs of society. This view Mr. Berr controverts, for he finds that the history of science not only shows the mind adapting itself to things and man taking possession of his environment, but it makes us follow the constitution of a method intended to solve the problems which the mind sets itself, and which it formerly tried to decide first in religion and then in metaphysics. Every medical man will take this view, which, in other words, finds science to be an instrument for solving philosophic problems; and the science of medicine in its modern manifestations is increasingly being shaped in this direction, in spite of the apparent divorce of the special sciences from philosophy.

The book forms a valuable section in this important historic series, but it makes quite difficult reading. In many places readers, save those specially equipped, will find a Greek lexicon necessary in spite of the occasional translation of terms and quotations, although familiarity with the original texts quoted from is not necessary for the comprehension of the arguments, and could not be expected from any save accomplished classical scholars.

DISEASE OF THE LOCOMOTOR SYSTEM.

Differentialdiagnostik der Inneren Krankheiten des Bewegungsapparates. By Dr. ERNST FREUND, Privat Dozent in the University of Vienna; and Dr. ALBERT SIMO, Bad Schallerbach (O.-Ö.). Dresden and Leipzig: Theodor Steinkopff. 1929. Pp. 58. M.4.50.

THIS fasciculus of a larger work ("Praktische Differential-Diagnostik für Ärzte und Studierende") treats of the differential diagnosis of internal diseases of the mechanisms of movement. In the introduction it is stated that the local manifestations of general diseases such as those of the nervous system, of the metabolic system, and the endocrine glands, are often to be observed in the organs of movement. The subject matter is considered under three headings: (1) the general diseases of the apparatus of movement such as acute polyarthritis, pains, and polyarthritis without fever; (2) the spinal column and various pains and their significance and occupation neuroses; and (3) in the lower extremity, limping, swelling of the knee-joint, and pains in various regions.

It will thus be seen that this booklet is an illustrated guide to the significance of various symptoms which appear in the limbs and particularly of the diagnostic value of painful sensations. It should be useful to the student and practitioner.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 9, 1929.

SPINAL ANÆSTHESIA.

THE birth of spinal anæsthesia occurred some thirty years ago when Prof. BIER, of Kiel, published the results of some experiments in which, for surgical purposes, he had introduced cocaine into the spinal canal. The method was sufficiently startling in its results to attract considerable attention. TUFFIER in France became interested, as did a number of surgeons scattered throughout the world. Soon, however, unpleasant concomitant and after-effects were observed to occur distressingly often, nor could their appearance be prevented by any precautions in technique. Spinal anæsthesia was abandoned except by a few enthusiastic workers who held strongly the conviction that in principle it was sound and must be capable of further development. Much of the difficulty lay in the fact that cocaine is a very toxic agent. When less dangerous drugs such as tropacocaine and stovaine became available interest in spinal anæsthesia was renewed. In this country valuable investigations were made in 1907 by A. E. BARKER, who was able to bring forward a series of cases where the advantages of lumbar anæsthesia were manifest. BARKER demonstrated first how a heavy anæsthetic solution could be made to assume that position in the spinal canal which was necessary so that the anæsthesia might spread to the upper abdomen. JONNESCO in 1909, by high injections, extended its use to operations upon the thorax, head, and neck. But because the physiology of the procedure was not well understood accidents still occurred which marred the brilliancy of the successful results, and led once more to a diminution of interest in the method. Hence until quite recently spinal anæsthesia occupied a very small place in the technique of most modern operating clinics, and when used at all it was reserved for operations upon the lower limbs. In the early stages of the war it was hoped that spinal anæsthesia would be of great assistance in combating the shock of serious wounds of the lower extremities, but soon it was asserted that shock was a contra-indication and another check to its popularity occurred.

It is really only since the war that attention has again been directed to the method particularly in connexion with the growing popularity of novocaine, which is the least toxic of all known local anæsthetics. Knowledge of the mode of action has accumulated, and a technique based on the use of novocaine, with the precautions which we have learnt to respect, has resulted in a striking diminution in the incidence of untoward accidents. On page 271 of this issue we publish a Hunterian lecture by Prof. C. A. PANNETT which deals with the use of spinal anæsthesia for operations upon the upper abdomen. Whilst for this purpose it is not so implicitly reliable as inhalation anæsthesia, it does promise very great advantages to the patient. It seems probable that before long spinal anæsthesia will be made as efficient and safe as general anæsthesia is to-day. The dreaded fall of blood pressure is not so much to be feared now that the mechanism of its production is known and that measures can be taken to combat it; the risk of permanent paralysis is negligible if novocaine be used and puncture takes place below the level of the cord; ocular paralyses are transient and have become progressively rarer; even the severe headache following operation is much less frequent with the modern technique, where a very fine needle is used for the injection. Inhalation anæsthesia, moreover, is not without its inconveniences. The patients who are given spinal injections are at least free from post-operative disturbances, are more comfortable in the days immediately following operation, and are immune from the late often very serious sequelæ associated with general anæsthesia. Intensive study designed towards the elaboration of a more perfect technique of spinal anæsthesia for general application is being pursued in America, where surgeons are seeking escape from the disadvantages of ether narcosis. Particularly valuable work has been done by G. P. PITKIN and F. C. MCCORMACK and H. KOSTER. This last observer has applied the technique to the whole body so that operations upon the head, neck, and upper limbs can be performed as freely as upon the lower extremities. In this he has followed LE FILLIÂTRE, who nine years ago advocated general spinal anæsthesia with cocaine. It was LE FILLIÂTRE who first introduced the method of reducing cerebro-spinal pressure before injection by removing definite volumes of cerebro-spinal fluid. His methods are drastic, consisting of the removal of 25–30 c.cm. of fluid and the forcible injection through a needle of large bore of 2·5 to 3 c.cm. of a 2 per cent. solution of cocaine hydrochloride. He was recently able[1] to report nearly 10,000 cases with only two deaths, though it must be admitted that few surgeons have been so successful and free from accident.

The development of anæsthesia by the spinal route is likely to be important. It should be emphasised, however, that caution is necessary and that inexperienced persons should study the story of failures as well as the list of successes before plunging into the spinal canal a needle of large bore filled with a highly toxic preparation. It would be unfortunate if for the third time a very valuable procedure should fall into disrepute.

CONTRIBUTIONS TO HOSPITALS.

TWO interesting cases have recently occurred in which the law has indirectly discouraged the gift of money to a hospital. In the first, the firm of BOURNE and HOLLINGSWORTH was refused permission to deduct a contribution to the Middlesex Hospital as a business expense in computing profits for purpose of income-tax. The firm's claim was not unreasonable. Since 1908 it had maintained two private hostels for its women employees and one for its men. A private nurse was kept at each and a doctor attended daily, but in cases of serious illness the members of the firm's staff were sent to the hospital. The hostels cost more than £1000 a year to maintain; if the company treated all serious cases under its own arrangements without sending them to the hospital the additional cost would be more than 1000 guineas. From 1904 to 1918 the firm had subscribed annual

[1] La Presse Médicale, 1928, xxxvi., 1320.

sums of an increasing amount to the Middlesex Hospital. In 1919 and 1920 an additional 1000 guineas was given. In 1921 and subsequent years the subscription was 100 guineas; in 1926 the company added a subscription of 4000 guineas. The extra sums in 1919 and 1920 were made because it was felt that there was an accumulated liability to the hospital on account of the frequent use made of it by the firm's employees during the war. The firm took a very proper view of its responsibilities for its employees and had an understanding (though not, of course, a binding agreement) with the hospital that none of its employees would be refused admission. From the firm's point of view, therefore, the subscriptions were a quid pro quo, a proper business expense and an admissible deduction as being (under the Income Tax Act Rules) money wholly and exclusively laid out or expended for the purposes of its trade. The claim was for deduction of the sums subscribed in 1919 and 1920, and it appeared that the Commissioners of Inland Revenue had actually allowed a subscription of 50 guineas as a business expense. The Inland Revenue, however, argued that this was a concession, not a legal right; alternatively, so ran the argument, the large sums subscribed in 1919 and 1920 were not wholly and exclusively laid out for the purposes of trade in relation to those particular years, because the subscriptions were intended to make up deficiencies for previous years. The Special Commissioners held that there was no legal right to make the deduction, and Mr. Justice ROWLATT agreed with them. He remarked, however, that if the Special Commissioners had taken the opposite view of the question of fact he would not have dreamt of disturbing their decision. On a question of fact the Commissioners' decisions are hard to shake. Counsel for the firm essayed to treat the matter as one of law not of fact, by submitting that the Commissioners had misdirected themselves in law by deciding that a hospital subscription could never be an allowable deduction. This view the judge was unable to accept; the upshot is that, to the extent of the taxation upon the amount subscribed, a hospital subscriber has been penalised. Whether the firm merely decided to show gratitude for hospital services rendered or whether the arrangement could be viewed as a simple, though informal, working agreement, the result is the same.

The second case in which the gift of money to a hospital was unfortunately discouraged by the law occurred at the Liverpool Assizes on Jan. 31st. In awarding some £3000 to a man injured by a motorist's negligence, the jury recommended that, if possible, there should be a further sum of £50 paid to the Stanley Hospital where the plaintiff had had 13 weeks' treatment. Mr. Justice WRIGHT pointed out that he had no power to award damages to anyone but the plaintiff. Counsel suggested that the jury might have awarded the sum to the plaintiff to be paid to the hospital for operations performed, but the judge replied that no such condition could be imposed. Hospitals, he said, have extraordinary hardships in having to deal with injuries, often serious, sustained by members of the public after being run into by motor-cars. "There ought to be some means by which they could be reimbursed; as a rule, the costs of the hospital are not included in damages at all, and the hospital has no claim." Hospitals might, he added, send in a bill to the unfortunate sufferer, and he might include that bill in his claim for damages. "It is certainly a matter which ought to be considered by the proper authorities." The learned judge presumably meant that Parliament should be asked to pass something of the nature of a Hospitals (Payment for Treatment) Bill, to provide that where a plaintiff recovers damages for personal injuries due to negligence, such damages may include sums reasonably paid or promised to a hospital for treatment in respect of such injuries. The companies which insure motorists against third party risks might object that the Bill would impose a burden on them; but at present their policy-holders are trading on the charity of the hospitals.

CONCENTRATED ANTITOXIN.

SOON after the introduction of diphtheria antitoxin 30 years ago, medical men began to inquire whether it would not be possible to obtain antitoxic serum of higher potency so that a large dose of antitoxin could be administered in small volume and that at the same time the incidence of "serum sickness" with its troublesome train of urticaria, malaise, and arthralgia might be lowered. Dried serum appeared to promise stability, and search was made for a reliable preparation of dry material which might be dissolved in a small volume of water when required for injection. Dried serum, however, was apt to become partly insoluble and the solution or suspension in water was not always limpid. This method of providing antitoxin has now fallen almost entirely into disuse except for isolated communities. But when E. P. PICK and his co-workers showed in 1902 that most of the antitoxin was attached to a certain easily separable fraction of the total protein in serum the possibility of concentrating serum by discarding the useless protein arose and was welcomed by serologists. When ammonium sulphate is added to serum to about one-third the saturation point, a precipitate is formed which is insoluble in water free of salts. This "euglobulin," when redissolved in saline solution, contains practically no antitoxin nor does albumin, which is precipitated by between half and full saturation with ammonium sulphate. The middle fraction, however, termed "pseudo-globulin," precipitated by ammonium sulphate between one-third and half saturation, and soluble in water or in saturated solution of sodium chloride, contains almost the whole of the antitoxin. The modern processes of "concentration" or purification, arising largely from the work of R. B. GIBSON and E. J. BANZHAF, are based on the application of these characteristic solubilities. The euglobulin and albumin, containing no antitoxin, are removed by fractional salt precipitation or by methods of electro-dialysis, and the pseudo-globulin, rich in antitoxin, is retained. By these processes concentrated antitoxin is produced which, for each unit of protein present, contains from two to three times as much antitoxin as the original serum. The concentration per cubic centimetre obviously depends on the protein percentage in the final fluid provided. It is found that with a protein percentage higher than 20—the limit under various official regulations—the fluid is undesirably viscous. In America, for many years past and, more recently in England, concentrated diphtheria and tetanus antitoxins have been in routine use. Concentrated or purified serum has now made its appearance in other European countries, though we understand that in Germany none of the antitoxins subject to control may be issued as serum concentrated with ammonium sulphate.

Various objections to the adoption of concentrated serum have been brought forward. During concentration, it has been said, certain curative bodies

f unknown composition are lost, and, therefore, nconcentrated serum has a more rapid and thorough ıfluence in diphtheria than does concentrated serum ontaining the same number of units; moreover, oubt has been thrown on the rapidity of absorption f concentrated serum compared with natural serum. IETSCH and BIELING,[1] working with serum con-entrated by evaporation, concluded that this serum as absorbed less readily than natural antitoxic erum, but the careful experiments of W. H. PARK nd colleagues appear to supply strong evidence hat this is not true of ordinary concentrated serum. linical experience in England does not confirm the bjections; medical superintendents of isolation ospitals, who have had ample opportunities of omparing natural and concentrated antitoxin, have, uring the past ten years, gradually transferred their avour to concentrated serum, and this is now used lmost universally. The change is the more impressive ı that concentrated serum formerly cost hospitals onsiderably more for a given number of units, and ; yields far less profit to the manufacturer. The atient's interests have, however, triumphed over hese objections, and the incidence of serum sickness as, by the use of concentrated antitoxin, been educed to a fraction of what it was when uncon-entrated serum was used. An objection of another ind has also been raised. TH. MADSEN, R. KRAUS,[2] and others, have questioned whether the lassical Ehrlich method of titrating antitoxin units neasures the real value of an antitoxic serum, and uggest that two antitoxins of equal unit value may ary widely in therapeutic potency because one may ave a greater "avidity," and may therefore seize nore speedily and more firmly any toxin molecules t encounters. This problem is at present the subject f inquiry by a committee of the Medical Section of he League of Nations.

The methods of concentration hitherto described pply to antitoxins designed for use in the reatment of diphtheria, tetanus, scarlet fever, lysentery (Shiga), and diseases caused by the gas-gangrene bacilli. An entirely different method of oncentration consists in adding the specific antigen o an antiserum and obtaining an antigen-antibody omplex which is separated by the centrifuge and hen split into its two components. Thus, red blood-ells added to antiserum absorb the hæmolysin and hæmagglutinin, and may be then separated by edimentation or spinning. By warming in appro-riate alkaline or sugar solution the hæmolysin may e freed from the red cells and obtained in a solution ontaining a minimal amount of protein. HUNTOON n 1920 (Trans. Philadelphia Path. Soc., 1920, xxii., 75) added pneumococci to antiserum and thus inked the specific antibody to the cocci; he then entrifuged the preparation and, by treating the cocci n weak alkali, was able to detach a highly potent ntibody which contained but a minute amount of itrogen—so small that 5 c.cm. of the solution would ot sensitise a guinea-pig. This achievement was cclaimed in certain quarters as a proof that antibody was not necessarily protein in constitution, but bio-chemists to-day do not unreservedly accept this view. In the Ramon flocculation method, the toxin added to antitoxic serum forms a union with the specific ntitoxin. The floccules can be separated by spin-ning, a portion of the antitoxin detached from the oxin by warmth and acid, and a purified antitoxin obtained. At present this process is not apparently, we believe, economically applicable to the commercial production of antitoxin.

All proteins known may sensitise animals and produce some form of liability to anaphylactic phenomena; if, therefore, antitoxins could be prepared free of protein, presumably serum reactions and serum sickness would disappear. But unluckily this hope has not yet been realised. The promising pneumococcal antibody prepared by HUNTOON was not entirely free of the property of causing reactions. RAMON has stated [3] that his purified serum does not cause reactions; we cannot trace the publication of the details of the process of preparation and comment must therefore be reserved. It is of interest to note that the antibody to pneumonia prepared by FELTON,[4] which has also been successful in other hands (see THE LANCET, 1928, ii., 766), is obtained by a variation of these methods of concentration which are based on solubilities of the various protein fractions. New processes are likely to develop on similar lines. The keen interest of the academic biochemist in the real constitution of antitoxin, as well as the wholesome rivalry between members of the scientific staffs alike in State and in commercial serum institutes, leads to ever active attempts to improve the potency of the sera used by the practitioner in his daily work, while State control ensures their safety.

[1] Arbeiten aus dem Staatsinstitut für Exper. Therap., Frankfurt a.M, 1928, xxi., 230.
[2] Zeit. für Immunitätsf., 1928, lviii., 399.
[3] La Presse Médicale, 1926, xxxiv., 323.
[4] Jour. Inf. Dis., 1928, xliii., 531.

Annotations.

"Ne quid nimis."

THE KING'S HEALTH.

THE removal of the KING to Bognor marks a definite stage in his illness, but we protest again that it is premature to speak of convalescence. There has been throughout the past week a slow but definite increase in strength, and we learn that a slight improvement has even been observed in the weight. On two occasions the KING has been allowed to sit up for a brief period when the relief to monotony was beneficial, and was appreciated by the patient. The latest official bulletin calls attention to these facts while it refers to the further employment of ray therapy. The position here is that in the choice of rays and apparatus the clinical condition of the patient has throughout been the controlling anxiety. When treatment was begun the exposure could only be made for short periods and on portions of the body in order to reduce the degree of disturbance to a minimum. The need at that time was the stimulation of parathyroid activity, the adjustment of calcium metabolism, the rectification of the leucocyte count, and the raising of the bactericidal power of the blood. The mercury-vapour lamp was judged, at this serious stage of the illness, to be the method of choice in furthering these ends, and we understand that there is reason to think that the progress which occurred during the period of the application of rays from this source was in part due to their influence. Local treatment of the wound by ultra-violet light has never been employed. The improvement now attained renders possible treatment by the carbon arc, with its more penetrating luminous rays.

OBSERVATIONS ON CRETINISM.

IN the current issue of the *British Journal of Surgery* (1928–29, xvi., 370) Mr. R. Lawford Knaggs makes a further contribution to the study of bone disease by a paper on changes in the bones in cretinism. It is well known, of course, that one of the most striking symptoms of cretinism is a defect in growth, resulting in dwarfism, which is associated with underlying disturbances in bone development; the most readily recognised of these are delay in the appearance of the centres of ossification and delay in fusion of the epiphyses. No serious attempt has hitherto been made, however, to collect the contributions of different observers and correlate the clinical, pathological, and histological findings. Mr. Knaggs here discusses these matters both in relation to endemic and sporadic cretinism and to cachexia strumipriva. It appears that it is endochondral ossification which is deficient in all three types, though membranous bone formation also suffers in some degree. C. Wegelin [1] is of opinion that any difference in this respect between the three types is one of degree only, the defect being least in the endemic disease. There is, at any rate, a good deal of evidence to show that in the untreated sporadic cretin ossification is usually at a standstill, while the cartilaginous epiphyseal discs often persist throughout life. In the endemic form, on the other hand, ossification is as a rule no more than delayed and after 30 years of age the epiphyseal junctions and synchondroses are only exceptionally found open. Consequently there is a difference in the growth curves of these types, for whereas in the untreated sporadic case growth has stopped for the time being, in the endemic type, though growth is slow, it is seldom disturbed so completely. It is the condition of the long bones in the cretin which is of particular interest. Besides being much shorter than those of a normal person they are relatively shorter in proportion to the length of the trunk, though the disproportion is not so great as in achondroplasia. There are striking departures from the normal also in the skull of the cretin, especially in the sporadic variety. Its infantile character is shown by persistence of all the sutures and synchondroses, and the cartilage bones are imperfectly developed. The spine and pelvis show similar defects. Histologically, one of the chief features in the bones is a diminution in the amount of cartilage proliferation in the zones of ossification, but there are also changes in the bone-marrow, active cellular tissue being replaced by fat. The marrow changes result in a great diminution of the amount of active blood-forming tissue and are probably responsible for the anæmia so often associated with cretinism. Mr. Knaggs emphasises the importance of the marrow also in the process of ossification, for it invades the zone of preliminary calcification, absorbs the cartilage, and lays the foundation of the new medullary spaces. This invasion by the marrow is continually going on. When, however, the marrow is largely converted into fatty tissue its activity must be seriously interfered with and the growth in length of the long bones consequently more or less interrupted. It is this inefficiency of the marrow in the invasion and absorption of cartilage that some authorities, with Langhans,[2] regard as the primary factor in the disturbance of bone growth in cretinism. It would be interesting to know how far the bone defects can be made good by thyroid treatment. Judging by the satisfactory rate of growth which follows the administration of thyroid extract, especially in the sporadic cases, it seems probable that the underlying bone defects must be largely corrected, but further pathological evidence is needed before this can be definitely established. The satisfactory results of substitution therapy in the case of the sporadic cretin are well illustrated by a case reported by Dr. L. J. Witts on p. 284 of our present issue. The patient, whose mother was myxœdematous, was not treated for cretinism until she reached the age of 21 by which time the symptoms were well developed but considerable improvement followed the administration of thyroid extract. Subsequently she developed diabetes, which was controlled by dietetic measures and insulin, and under the continued administration of thyroid extract she later became pregnant. Unfortunately, owing to an oversight, during the later months of pregnancy she did not receive any insulin and developed diabetic coma. This was satisfactorily dealt with but shortly afterwards labour began spontaneously and she was delivered of a seven to eight months' fœtus, which showed early maceration. The patient herself remained in good health. This case is of great interest because pregnancy in a cretin is comparatively rare, and pregnancy in a cretin who has diabetes—a disease also inimical to pregnancy—is possibly unique.

[1] Corresp. Blatt f. Schweiz. Ärzte, 1916, xlvi., 614.
[2] Virchows Archiv, 1897, cxlix., 155.

PREVENTION OF DISEASE IN THE ARMY IN INDIA.

COLONIAL administrators will find encouragement in the story of preventive medicine in the British Army in India, as told by Lieut.-Col. J. Mackenzie in recent numbers [1] of the *Journal* of the Royal Army Medical Corps. A hundred years ago the death-rate only was considered, and that was 71 per 1000 men; mere sickness was thought inevitable, and was due mainly to cholera, dysentery, enteric fever, and malaria. In 1860 the death-rate had fallen to 32·5, but in 1867 it was carried up by cholera to 37. The provision of good water-supplies got rid of cholera, and probably lessened dysentery and enteric fever, though this last came into greater prominence in the eighties when young soldiers began to come out to India. In 1887 the death-rate was 15, and there was a notable fall in hospital admissions in 1898, in which year the first bacteriologist was appointed at Army Headquarters. In 1900 the admissions for malaria were 321·1 per 1000, and the Principal Medical Officer, Bengal, was considering if mosquito nets should be supplied. Ten years later they were being privately purchased by units; otherwise antimalarial work chiefly consisted of drainage and oiling. Since 1921, and especially since 1924, great efforts have been made, and the number of cases has decreased correspondingly. In 1925 an extra £7000 was allotted to antimalarial measures, and Major M. B. H. Ritchie drew attention in the Corps journal to the old idea of Hyder Ali, Sir Henry Lawrence (1846), Parkes (1864), and Sir Ranald Martin,[2] that European troops should be kept as much as possible in the hills. This idea, christened "cold storage," was accepted, and an educational malaria film was shown to all ranks and families. In 1926 £11,000 was allotted, and £20,000 for mosquito proofing of barracks. In 1927 "cold storage" was extended, propaganda was improved, and £14,000 granted for antimalarial measures. The cases treated fell from 472·3 per 1000 in 1924 to 297·3 in 1927. The methods of to-day are, to summarise Colonel Mackenzie's statements, keeping troops in the hills when they can be spared; mosquito-proofing of barracks; fumigation of hibernating mosquitoes; propaganda, especially the Rockefeller film; personal care; nets, fans, clothing; oiling and similar measures; effective treatment of cases; and cöordination under a malaria officer. The prevention of malaria was assigned as a duty to the R.A.M.C. in 1924, and the subsequent improvement has justified this decision and the heavy expenditure, for there were nearly 10,000 fewer cases in the British Army in India in 1927 than there would have been at the 1924 rate.

[1] October, November, and December, 1928.
[2] THE LANCET, 1868, i., 185.

ETHER AND DUTY-FREE SPIRIT.

ALTHOUGH a few years ago there were some authorities who derided the advantages of pure ether, and indeed claimed for certain impurities the chief anæsthetic effects of the liquid themselves, to-day there is general agreement that this idea was unfounded. A large amount of good work, notably by J. H. Dale and H. King in this country and W. Storm van Leeuwen abroad, has established the fact that the purest ether is also the best anæsthetic ether. That being so, it is gratifying to know that at last it is possible for every manufacturer of ether to obtain rectified spirit duty-free for the manufacture of the anæsthetic. This desirable end has been brought about, we believe, largely through the activities of the Anæsthetics Committee set up by the Medical Research Council and the Anæsthetics Section of the Royal Society of Medicine. The result of allowing the manufacturers to get alcohol through the customs without duty should materially lessen the price of ethylic ether, and already we notice an announcement in our advertising pages showing that at least one firm has taken advantage of the opportunity to provide pure ethylic ether at the price hitherto charged for that from methylated spirit.

TYPES OF FOOT-AND-MOUTH VIRUS.

FOOT-AND-MOUTH disease has a double interest at the present time. Not only is it a constant menace to stock-breeders and the cause of serious economic loss, but it is one of the most prominent members of the group of virus diseases upon which so much attention is now concentrated. It is, in fact, the doyen of these maladies, since it was in connexion with it that Löffler and Frosch in 1908 first demonstrated the possibility of the transmission of a malady from subject to subject by body fluids deprived of visible cells or bacteria. In spite of the devotion of much time and energy to its study, very little of any moment has yet been discovered as to the nature of this disease or the method of its control. Most of the research, apart from the purely scientific question of its nature, has been concentrated on finding means to provide an effective artificial immunity to this acutely infectious disease. The problem has been the concern of many workers in different countries, and it has recently been re-stated from the French point of view by MM. H. Vallée and H. Carré[1] who, at the veterinary school of Alfort, have since 1920 continued the studies begun there in 1901 under the guidance of Roux and Nocard. The primary difficulty is to ascertain if the establishment of a true immunity is at all possible, since clinical facts and experimental investigations give very contradictory results. A factor in this confusion, perhaps the chief factor, has lately been disclosed in the discovery of the existence of different races or strains of foot-and-mouth virus which are immunologically distinct, though in other ways indistinguishable, and which do not confer any reciprocal immunity; in fact, the absence of such cross-immunity is the only criterion by which they can be distinguished from one another. The types of virus at present known are classified by Vallée and Carré as the O variety, obtained from the Department of the Oise, and the A variety, of German origin. The existence of these separate and immunologically independent strains explains many of the anomalous results previously obtained, including the occurrence of second attacks at short intervals after recovery from a first attack, and has enabled the duration of the immune period against a single strain of the virus to be effectively determined. Similar results have been obtained in other European countries and in the United States. As a result of many experiments, it seems that the immunity conferred against the O virus by an attack of the disease due to this type is of not less than a year's duration, although exceptionally second attacks and relapses occur. The O virus confers no immunity whatever against the A strain of virus, and this holds good in the opposite direction. The immunity developed against type A appears to be of somewhat shorter duration. It has been found possible to produce in the same animal a simultaneous infection with both types of virus, and as a result to procure a double immunity in the recovered animal. This procedure may point the way to the ultimate goal of a successful and lasting immunisation, although inasmuch as the active immunity which follows an attack is only of short duration, the prospect does not appear too promising. It may be noted that the results of certain efforts of Vallée and Carré to hyperimmunise animals artificially have had a directly opposite effect to that intended, and have resulted in the re-establishment of the receptive state. A third type of virus, known as type C, has recently been identified by O. Waldmann and K. Trautwein.[2] The problem of this specific virus disease is therefore one of many difficulties, not the least of which is that the investigator cannot apply ordinary bacteriological methods to its investigation.

[1] Annales de l'Institut Pasteur, 1928, xlii., 841.

EXPERIMENTAL ARTHRITIS DEFORMANS.

THE experimental pathology of chronic arthropathies has not so far led to much advance in our knowledge of the subject. Most of the work has had a bacteriological bias. Attempts to cultivate bacteria from the cavity and surrounding tissues of affected joints, and by inoculation to produce changes in the joints of animals, have not, however, yielded important results. Some observations made from an entirely different point of view give promise of yielding more fruitful results. R. Leriche and E. Brenckmann[3] found, in histological preparations of material removed from an affected joint, areas of necrosis of bone associated with areas of new cartilage and bone. They were led to formulate the hypothesis that necrotic areas of bone in the epiphysis actually provoked the laying down of new cartilage and bone. They proceeded to test this theory in animal experiments by inserting into a joint grafts of fresh bone taken from another part of the animal. Macroscopic and microscopic preparations at varying intervals after the graft had been implanted showed that a series of changes occurs with regularity. The graft quickly dies and is invaded by giant cells which slowly absorb it. About the fourth week, however, in the immediate neighbourhood of the graft, now in process of being absorbed, a rapidly growing mass of new fibrocartilage is found; this becomes penetrated by blood-vessels and later ossified. These new formations of bone and cartilage occur whether the graft is placed in the joint cavity or beneath the cartilage lining it. When the graft is fixed for 15 to 30 minutes in absolute alcohol before it is placed in the joint it is merely attacked by giant cells and absorbed; no new formation of cartilage or bone occurs. Leriche and Brenckmann have applied these results to the interpretation of the changes found in osteo-arthritis. If the phenomena occurring in these animal experiments take place also in pathological lesions of the joints in man, it seems possible that the formation of cartilage or osteocartilage in the articulations of man are consequent on necrosis in the bone or cartilage near the joint. If this is so, the source of the arthropathy is to be sought in the epiphysis, and the problem of the origin of these diseases will be reduced to finding the cause of foci of necrosis of bone and cartilage in the epiphyses. Dr. Leriche has long been interested in the normal and pathological growth of bone, and his experimental work on pathological lesions follows an exhaustive study of the problems of ossification in which with the collaboration of Dr. A. Policard, he has been engaged for more than ten years (see THE LANCET, 1928, ii., 662). His conclusions as to osteogenesis are heretical but command

[2] Berl. tierärztl. Woch., 1926, xlii., 569.
[3] La Presse Médicale, Nov. 14th, 1928, p. 1441.

respect since they are founded on very careful histological work. The investigation of the processes involved in the formation of new bone in osteo-arthritic joints may serve a double purpose in clearing up the physiology of bone growth, and will be followed with great interest.

COLONIAL VETERINARY SERVICES.

LAST July the Secretary of State for the Colonies appointed a committee to consider the best means of obtaining a high degree of efficiency in veterinary research and administration in the non-self-governing dependencies. The Colonial Office Conference had already approved the principle of the ultimate creation of a colonial scientific and research service. The report of the committee has just been published [1] and emphasises the profound importance for the health of the Empire of adequate veterinary activities. Meat- and milk-supply, the advance of agriculture, and the growth of fodder crops are all services that must depend upon the veterinary surgeon for their efficiency. His work can no longer be limited to the treatment of specific diseases or the prevention of the spread of epizoötics. Animal nutrition and genetics are of immense significance in the prevention of disease, and the collaboration of the veterinarian is essential in the solution of such problems as the trypanosomiases and virus diseases. The committee finds that the veterinary surgeon of to-day is involved in a vicious circle between the complaint that he is not scientific enough and the habit of treating him as inferior to his more scientific colleagues, so that men of high scientific training will not enter the profession. The veterinary departments of the colonies are on the whole understaffed and the standard of entrance to the service is low. There is no provision for post-graduate education; there is no research station, no system for collecting, editing, and distributing information, and no advisory authority on the larger aspects of veterinary work and research. The blame is distributed between the colonial Governments and the training and headquarters organisation of the veterinary officers. The former are responsible for inadequate interest, organisation, and financial support. The chief reform demanded of the latter is that the status and prestige of the service shall be considerably improved. The figures given in the report are sufficient to show the enormous importance of the veterinary problem, and the example of South Africa demonstrates the financial return to be obtained from expenditure on the veterinary service.

The first reform recommended starts at home, with improvements in the M.R.C.V.S. syllabus. Holders of the Natural Science Tripos or of science degrees are to be urged to enter the colonial veterinary service; students studying for the M.R.C.V.S. should be encouraged to take the B.V.Sc. or B.Sc. concurrently; and all newly appointed officers should have a special course of instruction in the peculiar problems of tropical veterinary science. A scholarship scheme is recognised as essential in order to build up the prestige of the service, although in the long run it ought to rely for recruits on its intrinsic attractions. The second line of advance is to be the provision of post-graduate courses in tropical veterinary science, including protozoology, entomology, helminthology, advanced pathology and biochemistry, animal nutrition and genetics, tropical hygiene and agriculture, and practical laboratory training. The committee recommends the establishment of a school of tropical veterinary science, modelled on the lines of the London School of Tropical Medicine, and gives detailed suggestions for its situation, curriculum, staffing, equipment, and finance. Thirdly, the report describes the advisory headquarters organisation that the committee would like to see established, to correspond with the advisory authority already existing on medical and legal matters, and with that shortly to be provided for agriculture. They suggest that an adviser on animal health to the Secretary of State for the Colonies and a consultative committee of animal health should be appointed, and that a joint body representative of agricultural and veterinary interests should be established. The duties of the official and these bodies are enumerated. Fourthly, the committee urges the organisation of research, finding that much valuable work is done under great difficulties and without possibilities of coördination. They consider that a new central research station should be established, preferably in East Africa, as a pivot for veterinary research in the colonial Empire; its staff is to consist as a minimum of a director, three senior and four junior research officers, a secretary-librarian, a recorder, a farm manager, an accountant storekeeper, an engineer, and four laboratory assistants. The report closes with a review of the colonial veterinary service as it is, and recommends the creation of a unified service including both specialists and field officers with salaries ranging from £600 to £3000 per annum. Officers are not to be limited to any particular colony, but their names are to be on a roster for service wherever required.

It will be obvious that the committee has executed its terms of reference thoroughly and painstakingly, and the report should be read with care by all who are interested in the wide problem involved. The reproach levelled at the present conditions of veterinary training should be taken to heart, not only by the authorities but also by the public, on whose goodwill—whether directly by donation or indirectly by taxation—improvement must depend. The report speaks in no measured terms of "lack of funds . . . apathy and lack of vision." The veterinary institutions visited caused "dismay at what we saw," and the contrast with those of other nations was "depressing." "Starved as they are of financial support, and cramped and confined in their activities, it is clear that impossible for the veterinary schools to give a training of the scope and quality needed. The profession must needs suffer in efficiency and prestige and consequently in the attraction it offers as a career to the youth of the country. A new policy is needed, framed on bold and comprehensive lines, supported by adequate funds, and carried through with energy and determination." The framing of the policy has been admirably done by this committee: it is to be earnestly hoped that the energy and determination will not prove lacking in those responsible for putting it into effect.

[1] Colonial Veterinary Service. H.M. Stationery Office, Adastral House, Kingsway, W.C. 1929. 9*d*.

INSULIN AND THE DEATH-RATE FROM DIABETES.

THOSE who are acquainted with the remarkable results achieved by insulin in individual cases cannot help wondering that its introduction into general practice should have made so little impression on the diabetes death-rate. It is true that, like all innovations in medical practice, insulin has not been universally accepted, and that it will probably be many years yet before it is promptly and effectively employed whenever diabetes does not yield to dietetic measures. There remains the undoubted fact that very many doctors are using insulin and getting results from its use, while the death-rate from diabetes tends to rise rather than to diminish. Some light on the puzzling situation is thrown by a statistical analysis published in the December *Bulletin* of the Metropolitan Life Insurance Company of New York. When the death-rates are calculated for specific age-groups and by sexes, it is found that definite changes have taken place since 1922 when insulin was introduced. Among males the diabetes death-rate has declined steadily for all groups up to age 45. At ages 45–64 the rate has remained roughly as it was. For ages 65 and over there is a definite increase. Among females the decline is limited to childhood and early adult life. "After age 55," says the report, "the increase has been practically uncontrolled." This makes a great impression on the net death-rate, since in the company's experience nearly half of the total

leaths from diabetes occur in women over 50 years of age. The general conclusion from these observations, and from reports over the U.S.A., is that the incidence of diabetes, especially in women, is definitely on the increase. Insulin does not cure the disease, but does prolong life. Consequently the gain from death in early life is offset by a loss in later years. The economic prosperity of America tends to produce more diabetes and insulin may take credit that the rising death-rate is not rising more rapidly.

SILICOSIS AMONG SANDSTONE WORKERS.

"Masons' disease" is well known to sandstone workers, and many masons are so alive to the dangers of inhaling dust that they wet the stone on which they are working. Other workers exposed to stone dust in quarries and elsewhere are less conscious of risk, but the obvious possibility of their being subject to silicosis led the Home Office and Mines Department to coöperate in an inquiry, the result of which has just been published.[1] The investigation—conducted by two medical experts—was confined to workers manipulating sandstone who were in actual employment on building sites or in builders' yards and quarries in nine selected areas. Clinical examinations were made by both doctors of 454 men; 266 radiological examinations were carried out at the nearest centre possible, and 140 samples of atmospheric dust were taken for testing. Radiography revealed fibrosis, probably silicotic, in masons, stone-dressers, quarrymen, rock-getters, and planers, and severe clinical fibrosis was found amongst the older masons, stone-dressers, and quarrymen. The mason is a skilled workman who fashions stones by hand with chisel and mallet, sometimes in a confined space; his exposure to dust is continuous and severe. Quarrymen and stone-dressers work stone in a less detailed and skilled fashion than do masons; they use the pick and haul, but usually in the open air. Rock-getters work at the stone face in open quarries, using the hammer, wedge, crowbar, and drill; their exposure to dust is not intense and their work is intermittent. Fibrosis was found clinically among the older getters and planers, but most of them had previously worked in other capacities in the stone industry. Drillers who had been long at work showed fibrosis, but quarry labourers, cranemen, and sawyers seemed to be healthy. The progress of the disease was divided into three stages. In the first nodular shadows and an increase of hilum shadow, of linear shadows and pulmonary reticulum, were to be found radiographically; and there might or might not be some impairment of working capacity. In the second stage the X ray showed an increase in the area of nodular shadows with a tendency to confluence of the nodules; and there were clinical symptoms with some degree of incapacity for work. The third stage involved total incapacity. Of the 112 cases found 90 were in the first stage, 21 in the second, and 1 in the third. The greatest number of cases occurred between the ages of 45 and 54; the disease seemed to be more common after the fortieth year of age and the twentieth of employment in the stone industry. The symptom most often complained of was dyspnœa; some of the men had coughs and a few had had hæmoptysis. Quite half of them, however, had no complaints to make. Their statements about the most dangerous kind of stone were unreliable and conflicting; they seemed apt to confuse the idea of danger to health with the degree of difficulty in working the stone. It was, however, impossible to say that any kind of sandstone or gritstone is innocuous to workmen. As the inquiry was limited to men actually at work the incidence of tuberculosis, the onset of which rapidly incapacitates, could not be estimated. Clinical examination and X ray films suggested the presence of this disease in several cases; but in all the advanced ones the picture could have been produced by silicosis alone.

[1] Report on the Occurrence of Silicosis among Sandstone Workers. By Dr. C. L. Sutherland and Dr. S. Bryson. London: H.M. Stationery Office. 1929. 1s. 6d.

It was found possible to diagnose fibrosis of the lungs clinically at an earlier stage than the silicosis was shown radiologically. This recalls the similar finding in the pottery industry,[2] and stresses the importance of chest examination at regular intervals, especially of workers who have been employed for 20 or 30 years in close and continuous proximity to a fine dust-cloud produced by a steel tool from sandstone. Investigations into the dust-content of the atmosphere led to the conclusion that the action of wind in diluting and removing dust was most important. Unfortunately workers in sheds cannot always stand to windward of their own and their neighbour's work. Wetting the surface helps the "getter," but does not greatly affect the fine dust produced by a cutting tool. To be effective water must be applied directly and in considerable quantity. Steam effectually lays dust produced in drilling. Respirators were used in some districts, but were very inefficient, and the men would not always wear them.

This report gives some measure of the occupational risk to which masons are exposed, especially when they are working a closely grained sandstone with its quartz particles closely packed and cemented by secondary silica. The investigators found 112 out of the 454 men they examined affected more or less—i.e., about one in every four. South African experience teaches that for early simple silicosis after a period of ten years there will be about the same number surviving as if the original diagnosis had been simple tuberculosis. If, then, we envisage the stone-mason, spending an otherwise fairly healthy life in the open air, having one in four afflicted with tuberculosis, we get some grasp of what this dust disease—silicosis—means in fatality. The only point in its favour is that it does not generally occur until middle life. Against this risk there is little to-day which can protect the man; steam, water-spray, and exhaust draughts for removing dust are not economically practical in the stone industry. A device is receiving attention whereby the dust may be removed when pneumatic tools are being used. But the simpler method is to give up using sandstone wherever possible. Already artificial wheels are replacing grindstones in the cutlery industry; there is no reason why the modern tendency to build with reinforced concrete should not be extended, while limestones have given to London its most beautiful structures, and Hampton Court stands as an instance of what can be done with bricks. Compensation has just been awarded for silicosis occurring in the stone industry; possibly this economic influence will go far to abolish the use of sandstone, which, we may say, is far less used in other countries than it is here. Medically we cannot but hope that the sandstone industry will be "improved" in this country out of existence.

[2] Report on the Incidence of Silicosis in the Pottery Industry. H.M. Stationery Office. 1926. 1s. 6d.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Feb. 11th Mr. Andrew Wylie will lecture on "The Difficulties Experienced in the Diagnosis of Laryngeal Diseases" at 5 P.M. at 11, Chandos-street, London, W., where, on Feb. 14th, at 4.30 P.M., Dr. Gerald Slot will lecture on Calcium Therapy. On Feb. 11th also Mr. Aubrey Goodwin will give a clinical demonstration in gynæcology at 2.30 P.M. at the Prince of Wales's General Hospital, Tottenham, and on Feb. 12th, at 6 P.M., Dr. J. E. M. Wigley will hold a clinical demonstration at St. John's Hospital, Leicester-square. On Feb. 13th, at 4 P.M., Dr. Daukes will give a demonstration on Various Types of Ulceration in the Intestinal Canal at the Wellcome Museum of Medical Science, 33, Gordon-street, W.C. On Feb. 11th a two weeks' course in gynæcology will begin at the Chelsea Hospital for Women and a four weeks' course in diseases of the skin at St. John's Hospital, Leicester-square. An intensive course will be held at the Brompton Hospital from Feb. 25th to March 2nd, and from Feb. 25th to March 9th a comprehensive morning course at the Hospital for Sick Children, Great Ormond-street. An eight weeks' course is in progress at the National Hospital, Queen-square. Further information may be obtained from the Fellowship of Medicine, 1, Wimpole-street, W.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXI.—THE SIGNIFICANCE OF OCULAR TESTS.

II.—Binocular Tests.*

When one eye fixes an object the other does so too; the slightly dissimilar images which are formed on the two retinas are interpreted as a single one. This power of seeing with both eyes simultaneously is called binocular vision, and that of fusion of the two images into one the fusion faculty. In some persons binocular vision is absent or poorly developed, in which case the vision in one eye is suppressed while the other is in use.

Test for Binocular Vision.

The presence or absence of binocular vision may be ascertained by placing a red glass transmitting only red rays before one eye, and a green glass transmitting only green before the other, the patient being told to look at a test object consisting of two strips of glass, red and green, illuminated by a light behind them. If binocular vision be present both red and green will be seen, but if absent either the red or the green, according to which eye is in use, and which suppressed.

The *stereoscope* also is employed as a test for binocular vision and the fusion faculty, two dissimilar pictures being used—for example, a bird on one side and a cage on the other. A normal person will see the pictures superimposed, the bird appearing to be in the cage, but if binocular vision be absent one or other picture only (either the bird or the cage) will be seen.

The Amblyoscope.—There is evidence that in some cases of concomitant squint a certain degree of binocular vision may be present, but that suppression of one eye may take place. The amblyoscope is an instrument which has been devised for the purpose of ascertaining the presence or absence of binocular vision in squint cases.

It consists of two metal tubes joined at one extremity by a hinge, so that the angle at which they are set can be altered at will to suit the angle of the squint; by this means it can be so arranged that each eye looks straight down its corresponding tube. At the ends of the tubes dissimilar pictures, translucent, so that they can be illuminated by extraneous light, are placed—e.g., bird and cage—and the power to perceive the pictures simultaneously proves the presence of binocular vision. This instrument is also used in cases of concomitant squint to train and develop the fusion faculty, which, if present, is usually feeble and may be improved during childhood by stereoscopic exercises.

Diplopia Tests in Ocular Palsies.

When normal binocular vision is present it is necessary, in order to obtain single vision, that the image of each object directly looked at should fall upon the central fixation point, or macula, of each eye; otherwise diplopia would occur. The external ocular muscles which move the eyes are so coördinated as to secure single vision in all positions of the eyes. In cases of *paralysis* or weakness of one or more muscles of one eye this coördination is lost, and binocular diplopia (double vision) results. If they are completely paralysed the affected muscle or muscles can easily be detected by making the patient move his eyes in all directions, when actual limitation of movement of the affected eye in the direction of the paralysed muscle can be seen. But where only muscular *weakness* is present, it is often impossible to detect any abnormality in the ocular movements by direct observation, and in such cases the diplopia experienced by the patient is used subjectively to determine which eye, and which muscle, or muscles, are affected.

The patient puts on a spectacle frame in which are mounted a red and a green glass, the former in front of the right eye and the latter in front of the left. The observer stands before the patient at a distance of about one metre holding a light, which is moved in all directions in turn, the patient being told to follow it with his gaze. When the eyes are moved towards the weak muscle coördination is lost, and the image of the light seen by the patient separates into two, a red and a green, the former belonging to the right eye, and the latter to the left; this separation of the images increases the further the light is moved in that direction.

By observing the position or positions in which diplopia occurs, and the relative position of the true and false images, the affected eye and affected muscle can be determined.

Paresis of an ocular muscle points to an organic lesion affecting either muscle or nerve, and is never a hysterical condition. It is present in many diseases of the nervous system, as well as in other conditions, and if a patient complains of diplopia the elucidation of the cause of this symptom is always of great importance. Ocular paresis, though not the only cause of diplopia, is much the commonest one.

Test for Heterophoria.

The external ocular muscles are normally perfectly balanced in a state of tone, so that there is an equal pull in each direction. This normal condition, in which the eyes remain straight without effort, is known as *orthophoria*. The muscular pull may, however, be of unequal strength; for instance, the internal muscles may be stronger than the external, the external stronger than the internal, or again there may be an upward pull on one eye against a downward pull on the other. When binocular vision is absent or suppressed, so that only one eye is used at a time, there is no stimulus for the eyes to remain straight; they then take up a position of rest, and the lack of balance becomes manifest as a concomitant squint, convergent, divergent, or vertical. In the presence of normal binocular vision, on the contrary, the eyes do not squint, but are kept straight by an unconscious effort: this effort is instinctively made in order to avoid the extremely uncomfortable diplopia which would result if the eyes were allowed to squint.

This condition of latent squint is termed *heterophoria*, and it is of great importance to be able to detect its presence and to measure its amount, since the unconscious effort to keep the eyes straight may give rise to distressing subjective symptoms, such as headache, giddiness, and nausea, with perhaps occasional diplopia. These symptoms may be relieved by the wearing of suitable prisms, or in extreme cases it may even be necessary to operate on the ocular muscles in order to attain a beneficial result. In other cases, again, treatment by means of exercises may be undertaken.

A rough test for the presence of heterophoria may be made by screening one eye with a card or the hand, while the other is made to fix a finger of the other hand. The eye covered by the screen moves away into the position of rest, and if the screen be removed quickly can be seen to move back at once into the position of fixation.

Maddox Rod.—Measurement of the amount of heterophoria is commonly carried out by the use of a Maddox rod. This consists of several rods of red glass, set side by side in a circular frame which is placed in front of one eye in an ordinary pair of spectacle testing frames. If a spot of light is looked at through this system of rods it becomes a streak of light.

The patient looks at a small spot of light six metres away, and while the uncovered eye sees the spot of light as a spot, the other eye sees a red streak, into which the light is transformed by the glass cylinders. This streak differs so much in appearance from the light that the eye does not interpret it as being the same object; for this reason there is no stimulus to keep the eyes together, and the eye behind the rod takes up the position of rest, just as it would if behind an opaque screen. If no heterophoria be present the covered eye remains straight and the streak is seen to cross the light, but if the balance of the muscles is abnormal, and the covered eye has moved out of the straight position, the streak will not fall on the centre of that covered eye, and will therefore appear to be at some distance from the light.

* Part I., Monocular Tests, appeared in THE LANCET last week.

For the purpose of testing the lateral muscles the d is placed so that the streak is vertical, while for sting the elevator and depressor muscles it is rotated to a horizontal position. The amount of deviation the vertical streak to one side or other of the light, in the horizontal position above or below the light, ay be measured by the strength of prism which, hen placed in front of one eye, is required to make ie streak appear to coincide with the light—the otical effect of a prism is to alter the apparent position objects looked at through it, so that they are splaced towards its apex. Or the deviation of the reak from the light may be measured on a scale arked in tangents, the light at which the patient is oking being in the centre of the scale. The patient is ked to say with which division of the scale the streak pears to coincide, its distance from the light giving e tangent of the angle of deviation.

Accommodation of the eyes for near vision, volving as it does the act of convergence, affects the alance of the external ocular muscles, and for this ason separate tests should be made both at six etres and at normal reading distance.

For the purpose of testing muscle balance at the tter distance special instruments have been devised r the sake of convenience, but their underlying inciple is the same—viz., that of dissociating the ages seen by one and the other eye, and thereby olishing the stimulus to keep them straight.

Test for Congenital Colour-blindness.

This condition is of importance in that it is a bar to rtain occupations, especially the railway and marine rvices. Many tests have been devised for its detec-on, one of the best known being the "*Holmgren's ools*" test. This consists in asking the candidate to lect from a heap of coloured skeins those which match colour certain specially chosen "confusion colour" mple skeins. Another test in common use is *dridge Green's lantern*, into the illuminated aperture which various coloured glasses can be placed in rn, under variable conditions of lighting, the ndidate being asked to recognise these colours. ther tests consist of a series of cards on which certain atterns made up of specially arranged multicoloured scs are printed, the recognition of these patterns pending on a normal colour sense.

Estimation of Intra-ocular Tension.

The *tonometer* has been devised as an adjunct to the timation of intra-ocular tension by means of the gers, and the type of instrument most commonly ed is the tonometer of Schiötz. Its circular concave otplate, designed to fit the cornea, is held lightly on ie previously cocainised eye, the patient being in a cumbent position, and the tension of the eye is dicated by a pointer which moves along a graduated ale.

The tonometer is by no means an instrument of athematical accuracy, and is relative rather than bsolute in its readings. While it can never replace ie tactile sense for the estimation of intra-ocular nsion, it is of real value when used by experienced ysicians in certain cases of glaucoma.

R. AFFLECK GREEVES, F.R.C.S. Eng.,
Surgeon to Moorfields Eye Hospital, Ophthalmic Surgeon to the Middlesex Hospital.

PAYING PATIENTS AT MANCHESTER.—At the annual eeting of the Manchester Royal Eye Hospital it was stated at the beds reserved for paying patients, a system begun year ago, are "an unqualified success, and have filled a ed which has been long felt." Nearly 33,000 out-patients ere treated, and accident cases numbered 11,848, an erage of 32 per day. Next year the Grangethorpe Ortho-edic Hospital will be vacated by the British Red Cross ciety, which has held it since the war, and will come into ssession of the Manchester Royal Infirmary. It is suggested at it should then be used as a hospital for the middle-asses. The number of beds in the Manchester hospitals served for paying patients is very small, notwithstanding ie large demand. Grangethorpe is in a quiet pleasantly tuated spot, within easy access of the infirmary.

Special Articles.

RADIUM TREATMENT OF CANCER IN FRANCE AND BELGIUM.

A VISIT TO THE CLINICS OF PARIS AND BRUSSELS.

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AND
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THE treatment of cancer by radium is receiving a degree of attention rarely accorded to any therapeutic method, and it is only natural that, at the many centres at which it is being practised, technical methods should have developed in different directions. It is therefore imperative that those who wish to be familiar with the latest advances should visit the different clinics at which radium treatment is being carried out, as only in this way is it possible to gauge the value of the results which have been obtained, or to form any idea of the lines along which progress is likely to proceed. With this object we have spent some time at the centres of radium therapy in Paris and Brussels, and we feel that it may be of value to others if we now report briefly the results of our observations. In the very short time at our disposal it was obviously only possible to take in general principles and to form very broad ideas. We have, however, returned home stimulated by the brilliant work we have seen, profoundly impressed by the solid progress which is being made, and not a little touched by the warm reception with which we have met and the generous way in which every avenue has been opened to us.

Paris.

Our first visit was to the Institut du Radium (26, rue d'Ulm, Paris Ve), which practically forms the out-patient department of the Fondation Curie. Under the directorship of Prof. Regaud the Institute has made great strides and is generally recognised as holding the leading place in the world. Prof. Regaud devotes the whole of his time to the work of the Institute and of its clinical section in the rue Antoine-Chantin. He is supported by Dr. Monod and Dr. Roux-Berger, familiar names in surgery, and by a large staff of highly trained assistants. The Institute works in association with the University of Paris, but, unlike most of the Continental clinics, it is a private society and does not depend directly upon the Government. It possesses seven grammes of radium, large X ray installations of the very latest types, clinical and experimental laboratories, and every facility for the convenient and sympathetic handling of patients; it has fully equipped laboratories for animal research, and adjoining it are the physical laboratories of the Institut Curie itself. On the afternoon of our visit "consultations" were in progress under the charge of Dr. Monod, assisted by Dr. Tailhefer, and it was an interesting example of French practice that the junior surgeon carried on the consultation, whilst the senior, Dr. Monod, sat beside and only occasionally gave a word of advice.

First there came a long series of cases of carcinoma of the cervix, and here for the first time we got an impression of the extraordinary prevalence of this condition in France. Most of the cases were of long standing and had been under treatment for years, and it was easy for us to follow, from the elaborate notes which were produced, the progress of each case and to see the various forms of treatment which had been adopted. There followed a series of cases of cancer in

other regions, chiefly the breast and face. Of these perhaps the most remarkable were a series of cases of epithelioma and of rodent ulcer of the face, some still untreated, many completely cured, and a few showing small recurrences after treatment.

The consultations finished, we were shown over the whole of the Institute by Dr. Marjorie Greene of the Royal Free Hospital, who is working as an assistant at the Institute, and whose knowledge both of the Institute and of our mother tongue was a delightful surprise. We were greatly impressed by the plain efficiency of all that we saw and by the elaborate care with which the notes of every case are preserved. In every single case the removal of a fragment of any tumour for microscopic examination is the unbroken rule, and no case is admitted to the statistics of cancer in which this proof is lacking. In most instances photographic records are preserved and in every case details of treatment and of progress are recorded in the most precise manner.

Approximately half the space of the Institute is given up to an elaborate X ray installation, to which we know of no rival in this country. The advantage of being able to combine radium treatment with the very latest methods of X ray therapy is too obvious to require comment, and it is not to be wondered at that in the hands of a clinician so experienced as Prof. Regaud such striking results have been obtained. We were surprised, however, to find that little attention is paid to radium emanation, only 300 mg. of radium being devoted to its production. The contrast with the opposite tendency in English practice was striking, and this was still more the case when we found that no emanation at all was used at the other centres which we visited.

Only next in interest to the Institute of Radium itself is the Centre Anticancéreux at Villejuif (14, Avenue des Écoles), one of the southern suburbs of Paris. Over this, the chief Government centre for the suburbs of Paris, presides Prof. Roussy, professor of pathological anatomy in the University of Paris, assisted by Dr. Bertillon, Dr. Wickham, and Dr. Mme. Laborde. Commencing as a small outgrowth from a poor-law hospital this has now become the "Institut de Cancère de la Faculté de Médecine de Paris," and it will shortly be accommodated in modern buildings covering a large area, including a hospital built on the most modern lines and laboratories which will be unrivalled for their purpose.

We were met by Dr. Bertillon, who spent more than three hours in showing us the hospital as it at present exists, and all the complicated apparatus which has been evolved for radium treatment. Dr. Wickham was engaged in consultations and we had the opportunity of being present at these and of seeing the actual application of some of the methods which we shall describe later on. We shall also refer later to the organisation of which Villejuif is an important centre, and which Dr. Bertillon explained to us in some detail. For the moment we will only mention two incomparable pieces of apparatus. One was a "radium bomb," a great mass of lead weighing half a ton, so delicately poised that it could be moved in any direction with a touch, and containing 1 gramme of radium. It was very securely locked. The other was an X ray installation operating in absolute silence at a pressure of 200,000 volts. Somehow we began to have doubts about the blighting influence of Government control.

Brussels.

Brussels is unique in that it holds practically the whole of the radium supply of the world. The deposits of Haut Katanga on the Belgian Congo were only discovered in 1922, but they soon eclipsed in production all other sources of radium. From them the Radium Belge Company draws its supplies for the works at Oolen, where extraction and purification are carried out. In the form of the bromide, radium is sent to the laboratories at Brussels, where for the most part it is converted into insoluble sulphate and packed into the needles and other containers in which it finally reaches the market. There is no question at all of any shortage of the element, which can be supplied at once by the Radium Belge in almost any quantity. We ourselves saw no less than 10 grammes in the Company's safe at Brussels. Owing to the kindness of the assistant director, Monsieur Adam, we were allowed to see the laboratories and to watch the methods by which the radium is handled, and we were greatly impressed by the scientific accuracy with which every process is carried out, and by the care with which every step is controlled.

At the Institut du Radium (7, rue Wéry) we were received by Dr. Sluys, the director, and by Drs. Neuman, Coryn, and Cahen, surgeons on the staff of the Institute. Here again we were impressed by the elaborate care with which records are kept and statistics prepared, and we were not a little envious of the organisation which made this possible. From the clinical point of view we had come on a bad morning, but we saw two cases of carcinoma of the rectum which had been operated upon by Dr. Neuman, after treatment with radium. In both cases he had been able to remove what was previously an inoperable tumour and in both the result was brilliantly successful. The methods of treatment adopted in the Institute were fully explained to us and we saw many of the appliances in use. Dr. Sluys, who has transferred his skill as an artillery officer to the service of radium, is concentrating upon treatment from a distance, and he showed us a most elaborate apparatus by means of which radiations from 13 "cannons," each containing a large source of radium, can be focused with the greatest accuracy upon one centre. By a mechanism of extraordinary ingenuity this centre can be shifted with precision so as to occupy any position within the body of the patient, with the net result that an enormous dose of gamma rays can be concentrated at a series of points, although the rays themselves pass through entirely different areas of the surface of the body, and the skin is saved from what would otherwise be a destructive dose. For a description of the apparatus we must refer to Dr. Sluys's papers, but for originality in conception, ingenuity in execution, and precision of action, it could not be excelled.

Methods of Treatment.

It is evident both in France and Belgium that the line along which most progress is expected, and on which most work is being done, is in the use of gamma rays from a distance. Radium is regarded chiefly as a convenient source of these rays of short-wave length, and it is used for their production very much as if it were a special form of X ray tube. The most striking example of this was the radium bomb which we saw at Villejuif, containing one gramme of radium and destined exclusively for the production of gamma radiations. But this was only one example of the general trend of thought.

The same principle was exemplified in the many ingenious appliances which we saw for supporting tubes of radium at a fixed distance from the surface of the body. In France these appliances were for the most part made of Columbia wax, a mixture of paraffin, beeswax, and sawdust, which can be moulded easily into any form. In the case of malignant deposits in the glands of the neck, for example, a thick collar is made of wax carefully moulded to the patient's neck and shoulders, and from 1 to 3 cm in thickness. On the outer surface of this the needles of radium are embedded, the needles themselves being platinum tubes with walls at least 0·3 mm. in thickness. The face is protected by a lead screen embedded in the wax cast. As a result the small percentage of beta rays which escape through the platinum is absorbed by the wax, as are also the secondary beta radiations which arise from the platinum itself. The net result is that the patient receives a pure gamma radiation, carefully distributed so that no portion of the skin receives a dangerous dose, whilst the glands beneath are subjected to a converging cross-fire.

In Brussels the same result was obtained in a somewhat different way. A thin case was made, exactly moulded to the contours of the body, and constructed of shavings of lime-wood glued together. On this light foundation were supported blocks of cork or of light wood so that each tube of radium was supported accurately at a distance of 5 cm. from the surface of the body. The tubes themselves were placed at approximately the same distance from one another, the whole area being so mapped out as to provide a uniform radiation to the surface, whilst again the principle of the converging cross-fire was maintained. The advantage of this system over wax was the extreme lightness of the appliance and the better ventilation provided.

The technique of needle insertion did not differ much from that practised in this country, except that it appeared to be usual to employ larger doses than are customary here. Needles containing 10 to 15 mg. of radium were not uncommon, beta rays being cut off by a platinum wall, 0·5 mm. or more in thickness. On the whole, however, the insertion of needles was not regarded with great favour, and our suggestion that operable cases of carcinoma of the breast might be treated in this way was evidently regarded as a dangerous heresy. In Brussels, however, we were told that good results had been obtained by the insertion of radium needles into the broad ligaments after a laparotomy in certain cases of cancer of the uterus, whilst we have already referred to two cases of cancer of the rectum removed after radium treatment by Dr. Neuman.

We were very much struck by the number of cases of cancer of the cervix which we saw, and the number must indeed have equalled that of all the other cases of cancer with which we met. The treatment appeared to be standardised and consisted in the insertion of a lead tube containing a large dose of radium into the cervical canal, whilst smaller amounts were packed into the lateral fornices. These were left in for five or six days and the patient was then subjected to heavy doses of deep X rays as a routine. The results appeared to be excellent, for many of the cases we saw were cured cases of long standing.

What we have said applies to general surgery, but in dermatology extensive use is being made of the direct application of radium, so that the beta rays have full effect. In Paris Dr. Paul Degrais, of the Hôpital Necker, showed us wonderful examples of the results which he has obtained in lupus, keloid scars, and angioma with surface applications of radium on varnished plaques. Most remarkable of all were several cases of huge cavernous angiomas in the face and neck in children, in which the local external application of radium had produced the most brilliant cures. From the method of application it is evident that the effect must be largely one of scarring from the action of the beta rays, although in the cases of keloid growths this will hardly explain the remarkable results which he has obtained. For rodent ulcers and epitheliomas, on the other hand, he has used large amounts of radium in heavy platinum or thick silver needles, with results maintained after several years.

Government Organisation.

The immense interest taken by the French Government in the problem of cancer is very obvious. By the kindness of M. Henri, director of the Radium Belge in Paris (54, Avenue Marceau) we were introduced to M. Géry, head of the special department of the Ministry of Health (offices, 7, rue Cambacères), devoted to this object and coördinating under its central control a series of 15 centres distributed throughout France. Each of these centres is to some extent autonomous and organises the work in its own district. Of the centres outside Paris the most important is Villejuif, which takes charge of the whole of the suburbs of Paris, and we owe to Dr. Bertillon a description of its work. At each centre is concentrated a large supply of radium and a staff who are expert in its use, whilst the patients are drawn from a series of sub-centres at which consultations are held on definite days of the week. Doctors in the surrounding districts send their cases into these sub-centres, and often accompany them in order that they may get the opinion of the expert. In this way patients are saved from useless journeys, and the central hospital from unsuitable patients, whilst the public, recognising the advantage of such a convenient arrangement, seek advice at a much earlier stage than would otherwise be the case. The clinics at the sub-centres are advertised widely by means of posters in which the word "cancer" is freely used, and stress is laid on the immense advantages of early diagnosis and treatment. We were very greatly impressed by the masterly skill shown in the organisation and the simple effectiveness of every detail. Some idea of the extent of this organisation may be gained from the adjoining table, and those who are familiar with French surgery will recognise many distinguished names among the directors of the centres. The amount of radium element available at each centre is a fair measure of its importance, and the grand total certainly furnishes food for reflection. It must be remembered that this does not include private supplies, and we were informed that the total amount of radium in France available for the treatment of cancer exceeds 50 grammes.

Regional Centres in Campaign against Cancer.

Town and address.	Director.	Grammes of radium available.
ANGERS.—Hospices Civils	Prof. Papin	1
BORDEAUX.—3, Rue Jean Burguet	Prof. Réchou	2
LYONS.—Hôtel-Dieu	Prof. Bérard	2
LILLE (to be opened shortly)		1
MARSEILLES.—9, Rue Edmond Rostand.	Prof. Reynès	1
MONTPELLIER.—Hôpital Suburbain.	Prof. Forgue	1
NANCY.—47, Rue de Strasbourg	Prof. Hoche	1
NANTES.—Hospices Civils	Prof. Gauducheau	1
PARIS.—Hôtel-Dieu, Parvis de Notre-Dame.	Prof. Hartmann	6
Salpêtrière, 47, Bould. de l'Hôpital.	Prof. Gosset	
Hôpital Tenon, 4, Rue de la Chine.	Prof. Gernez	
Assistance Publique, 3, Avenue Victoria.	Mons. Potel	
Hôpital Necker, 151, Rue de Sèvres.	Dr. Robineau	
Saint-Antoine, 184, Fg. St-Antoine.	Dr. Lapointe	
Lariboisière, 2, Rue Ambroise Paré.	Dr. Labey	
Villejuif, 14, Avenue des Écoles.	Prof. Roussy	3
Fondation Curie, 26, Rue d'Ulm.	Prof. Regaud	7
RHEIMS.—53, Rue Simon	Dr. Baud	1
RENNES.—Pavillon Clémenceau a Pontchaillou.	Prof. Marquis	1
STRASBOURG.—Hôpital Civil Pavillon Paul Strauss.	Dr. Gunsett	2
TOULOUSE.—Hospice de la Grave, Place Lange.	Prof. Marie	1½
	Total	31½

Conclusion.

Although it must be very obvious from what we have said that France has seized radium with both hands, and that she is far ahead of us in organisation, we would not have it thought that we do not fully appreciate the splendid work which is being done in England. Our personal debt to the Radium Institute of London, to Mr. Hayward Pinch and his staff, and to our many friends in other centres, is far too great for that to be possible. Our visit has indeed convinced us that in many ways we are in advance of our Continental colleagues, and we have returned with an increased admiration for the work of our own countrymen. But we went to France and to Belgium to learn, and we have learnt a great deal about the surgical possibilities of radium. We have learnt still more of the warm hearts of our colleagues abroad, who placed their time and their resources so generously at our disposal, and we feel that we can best show our appreciation by urging our colleagues on this side to follow our example.

MEDICINE AND THE LAW.

Problems of Consolidated Legislation.

THERE are puzzles in the mechanics of law-making as well as in the substance of the law. The Food and Drugs (Adulteration) Act, 1928, consolidating and replacing the previous enactments, did not come into force till Jan. 1st, 1929. The licensee of a Wimbledon hotel was summoned last week on the charge of having sold whisky to which 9 per cent. of water had been added. The alleged offence took place in December, the charge was heard at the end of January; under which Act should the proceedings be taken? The prosecution chose the new Act, whereupon counsel for the defence objected; the 28 days within which the summons could be taken out having elapsed, it was now too late to initiate proceedings under the old Act. The magistrates ruled that the objection was valid, though Section 37 of the 1928 Act provides that samples taken under the old Act are available under the new. This latter point may be important if a case is stated for the opinion of a higher court. A year or two ago, it may be recalled, proceedings against a defendant under the Dangerous Drugs Acts were terminated abruptly in the Court of Appeal because the prosecution had relied upon the Act of 1925 and that Act was not yet then in operation.

Another misunderstanding over the consolidation of enactments occurred in the House of Commons on Jan. 30th. Regulations under the National Health Insurance Act must be laid before Parliament and may be attacked by the presentation of an address to His Majesty (by either House) within 21 days; if such an address is presented, the Regulations must be annulled. The National Health Insurance (Medical Benefit) Consolidated Regulations have come into force but were liable to attack in this fashion for the 21-day period. They consist mostly of clauses which were already part of the law, but they also embody a few new features. Mr. W. Hirst, M.P., moved an address praying for the annulment of the Regulations, but it appeared that his objection was to the old law, not to the new. He was reopening hostilities towards a provision dating back to last April under which it is forbidden to give inducements, discounts, or rebates in connexion with panel prescriptions. The coöperative societies resent this prohibition because it prevents the writing of dividends on prescriptions presented by members to the societies' drug departments. On the other side the retail chemists argue that to distribute dividends on prescriptions is to given an indirect incentive to malingering; the patient, they say, has an interest in increased prescriptions and this involves extra work for the medical practitioners; moreover, to distribute profits to coöperative society members may suggest to the Minister that the margin of profit at present allowed on health insurance prescriptions is too high and ought to be cut down. The merits of this dispute were not fully debated in the House of Commons on the recent motion, for the Speaker ruled the motion out of order. The power to pray for annulment of Regulations applies only to new Regulations laid before Parliament, not to old Regulations which are being reproduced by consolidation. The Minister pointed out that the motion could not have the desired result. If the recently laid Regulations repeal and replace Regulations made last April to the same effect, their annulment would merely revive and restore the identically similar Regulations of last April.

An Inquest without a Body.

The wisdom of our ancestors established the legal principle that there could be no coroner's inquest of death unless there were a dead body lying within the area of the coroner's jurisdiction. It might be difficult to say whether scanty remains of a human being amounted to a dead body within the Coroners Act, but coroners were often content to hold inquests upon almost any recognisable portion of a human body and occasionally, when once the inquest was opened, evidence of other portions became available. In R. *v.* Haslewood in 1926 the High Court reaffirmed the old rule that there could be no inquest unless the coroner viewed the body; if the coroner omitted this duty the proceedings were extra-judicial and void. The amending Act of 1926 permitted an inquest to be held, upon the special direction of the Secretary of State, where death is believed to have occurred within the coroner's jurisdiction and where "owing to the destruction of the body by fire or otherwise, or to the fact that the body is lying in a place from which it cannot be recovered," an inquest would not otherwise be held. Where such an inquest is held without a body, the law relating to coroners and inquests is to apply subject to any necessary modifications. The Home Secretary gave a direction under this new statutory power with regard to the supposed death of an electrical engineer named Jenkins who was believed to have travelled in the train which met with an accident at Charfield last October. No trace of his body was found. His landlady, who lived at Derby where he worked, said he left her house to catch that train to visit his mother at Milverton in Somerset. A solicitor's clerk who travelled on the train identified Jenkins from a photograph as a man who had joined the train at Derby and had said he was going to see his mother in Somerset; he left the man in a compartment alone at Birmingham. A railway official verified the issue of a week-end ticket from Derby to Taunton (near Milverton) at the proper date. Only two other pieces of evidence were before the coroner's court. One was a shoe found among the debris of the accident some weeks after the smash. It was originally brown and had turned black; his landlady gave the rather vague testimony that it looked something like the brown shoes which Jenkins used to wear. The other was the fact that there were still two bodies taken from the scene of the accident and still unidentified. Dr. Welchman Ward, of Wootten-under-Edge, said neither of these could have been Jenkins; one was obviously the body of a child, the other was that of a youth 13 or 14 years old. The jury found that Jenkins had been on the train and had been accidentally killed.

It will be noted that the inquest was not upon the unidentified bodies which had presumably been dealt with at the earlier inquiry into the death of the victims of the accident. It was, in effect, merely an inquiry whether Jenkins was alive or dead, the sort of issue which might affect a life insurance policy or would determine the question of death registration. The proceedings thus became analogous to the more expensive course of applying to the Probate Division for leave to presume the death of a person who has disappeared, when affidavits of belief of death are required. It is possible that stronger evidence of death would be necessary for one purpose than another. Supposing, for instance, the engine-driver had been criminally negligent and all the other passengers except Jenkins had nevertheless survived the accident, would the disappearance of Jenkins have amounted to proof of death sufficient to support a charge of manslaughter?

REMOVAL OF QUEEN CHARLOTTE'S HOSPITAL.—The managing committee of Queen Charlotte's Maternity Hospital has decided to remove the hospital, with the nurses' home, the post-graduate and students' college, from the Marylebone-road to a quieter site. Plans have been prepared, the approval obtained of the Ministry of Health and King Edward's Fund, and negotiations for the acquisition of a new site are proceeding. It is proposed that the buildings should comprise an isolation block for cases of puerperal fever, with space for research laboratories, with the object of attacking the problem of maternal mortality. This will be the first block to be erected. Another block is to be devoted mainly to prenatal cases. Rooms, on a comparatively extensive scale, are to be provided for paying patients of moderate means.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Influenza in Dublin.

ALTHOUGH the medical officer of health for Dublin has thought it necessary to advise the closing of the schools for the period of a fortnight, the type of influenza in Dublin at present appears to be mild. Some cases of influenzal pneumonia are coming under treatment, but are by no means severe. Nevertheless, the disease appears to be affecting the mortality tables. In the week ending Jan. 26th the mortality in the Dublin Registration area was 23·6 per 1000 per annum, while for the four weeks ending on the same day the rate was 19·9, a rate equal to the mean for the corresponding period of the previous ten years. The deaths, 192 in number in the current week, included 6 assigned to influenza and 14 from pneumonia.

The Rotunda in Need.

The governors of the Rotunda Hospital have issued a special appeal for the sum of £20,000, which is urgently needed to carry out the improvements which are necessary to keep the hospital in the front rank of modern progress. It is many years since there was any capital expenditure on the hospital. A new operating theatre is required. The pathological laboratory is too small, and there is insufficient accommodation for the X Ray Department and for the Infant Care and Prenatal Care Departments. The main part of the present building has been in use for over 170 years, since it was built by Bartholomew Mosse, the founder and first Master of the hospital. The Rotunda was the first maternity hospital in the British Empire, and until recently was the largest. It still retains its position as the premier obstetric school, and its many contributions to the science and art of midwifery are well known. At present the hospital attends over 4000 confinements in the year. It is to be hoped that the governors will receive a generous response to their appeal, so that the hospital, under the progressive guidance of its present Master, Dr. Bethel Solomons, may continue to hold its high place.

An Unqualified Practitioner Sent to Prison.

Last week, in Dublin, Rasfara Mahare was convicted by a jury of posing as a qualified medical man without being registered, and was sentenced to two years' imprisonment—the maximum penalty for the offence—and fined the sum of money found in his possession. An advertisement in the papers had drawn the attention of the police, who acted with such promptitude that the man was only a fortnight in Dublin before he was arrested. He said that he had been practising in England for 20 years. Subsequent to his conviction the State Prosecutor stated that the police had reason to believe that the prisoner had been attempting to start the white slave traffic in Dublin. He had been known under 16 different aliases, and had been previously convicted 23 times. The prompt action of the police was commended by the judge.

British Pharmaceutical Conference.

It has been announced that the forthcoming meeting of the British Pharmaceutical Conference is to be held in Dublin this year, and will open in the Mansion House on June 24th. Invitations have been issued to 300 pharmaceutical associations in Great Britain. Arrangements are being made for attractive amusements for the visitors as well as for the work of the Congress. It is 27 years since the Conference last met in Dublin.

The Work of the Local Appointments Commission.

At its last meeting the Council of the Irish Medical Association expressed its approval of the method of making appointments under the Local Authorities (Employés) Act. This approval, in which all intelligent and honest opinion agrees, does not purport to cover all the methods adopted by the Local Appointments Commission. Some of the grievances to which candidates are subjected were discussed at a meeting of the Munster Branch of the British Medical Association held in Cork a few days earlier. It appears that a candidate for an appointment has to pay a fee of £1 to £2, and has also to pay his own travelling expenses for an interview with the Selection Board. Some of these fees are returned to unsuccessful candidates. A candidate who applies later for another appointment has to undergo the whole process and expense again. One gentleman declared that within the past year applications for positions cost him £50. This heavy taxing of candidates is all the more inexplicable in that the professional members of the Selection Board are in the habit of giving their services gratuitously. It appears to be unnecessary and irritating to summon all candidates, and not only those on a select list, to an interview. The present method is a great advance on the previous method of making appointments, but it should only be regarded as a step to the establishment of a State service with entrance by competitive examination.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

*Local Government (Scotland) Bill.**

MEDICALLY the new Government clauses for treatment of sick persons are by far the most important in the whole Bill. They deserve the most careful study. In essence they are really a reversion to the general power to provide "hospitals for the sick" contained in the Public Health (Scotland) Act, 1867. But, under that Act, nothing whatever was done to provide for anything but infectious diseases. In the 1897 Public Health Act provision by local authorities was restricted to infectious diseases. Now the wider conception is again established. The clauses cover at one sweep the whole problem of the treatment of sickness. It is enough to say that these comprehensive clauses, which affect the voluntary hospitals as well as the official hospitals, have the support of all those familiar with Scottish hospital problems. Any scheme to be approved under the new Act by the Department of Health must provide that all reasonable steps are taken to secure full coöperation with every voluntary hospital, university, or medical school within the area or serving it.

Aberdeen Hospital Scheme.

The new Royal Hospital for Sick Children at Aberdeen has now been formally opened by Viscountess Cowdray. This hospital, it is important to remember, is an entirely independent body. The funds for it have been collected over a period of 18 years. The war interrupted the project for a new hospital; but, fortunately, a site was available on the same campus as will ultimately contain the buildings of the "Joint Hospital Scheme." Architecturally the hospital adds to the reputation of Dr. William Kelly, A.R.S.A., whose work for the last 40 years is conspicuous among the Aberdeen public buildings. Meanwhile the fund of £400,000 for the new Royal Infirmary on the same campus is within £30,000 of completion. This is a marvellous record. It shows two things: first, that Prof. Matthew Hay's conception was on sound lines, and second, that a very widespread community is now conscious of the need for an institution with full modern equipment in association with a great teaching medical school. The Woodend Hospital, opened in 1927, will be supplemented by the more adequate new Royal

* The opening discussion on the Bill in Committee in the House of Commons is reported in our Parliamentary columns.—ED. L.

Infirmary, and Aberdeen will thus become a typical example of regional grouping of hospital institutions around a medical school. This idea is rapidly gaining ground in Scotland.

Influenza.

For the week ending Jan. 19th the notifications of acute primary pneumonia and acute influenzal pneumonia in Scotland numbered 748 and 303 respectively. This was for large burghs and populous areas only. In Glasgow alone the numbers were 554 and 220. For the week ending Jan. 26th, the corresponding figures were: pneumonia, 1175; influenzal pneumonia, 504; for Glasgow alone, 813 and 332. Notifications thus show the same relative increase as the deaths. In Glasgow for the four separate weeks ending Jan. 26th, the deaths from influenza were 14, 49, 149, and 233; for pneumonia, 59, 118, 187, and 297; for bronchitis, 39, 70, 108, and 107. Totals, 116, 253, 342, and 654. These figures indicate an epidemic expansion. The notifications are, of course, not a complete indication of the amount of influenza, as a recent visit to Glasgow convinces me. Medical men themselves have been very largely affected; but the attacks have been mild and the urgency of practice makes sufficient personal care impossible. The extreme fatigue following exertion is a very usual phenomenon. In Edinburgh influenza is also prevalent, but the exact figures are less readily available. Prevalence is, however, indicated by the fact that several public functions have been postponed and absenteeism at schools has been marked. At one public dinner, 22 apologies for absence were received. However, the weather conditions of Edinburgh, though fairly severe, have not been as detrimental as in the west.

Housing in 1928.

The full official figures for 1928 are now available. The table issued by the Department of Health presents many interesting national features as against the corresponding figures for England.

	Completed.	Under Construction.
1919 Act	25,129	—
do. (by Public Utility Societies) ..	421	—
Private Subsidy Schemes (1919) Additional Powers Act	2,324	—
Slum Clearance Schemes	8,668	2,683
1923 Act—by Local Authorities ..	4,006	—
do. —by private enterprise ..	14,502	2,378
do. —by Public Utility Societies	80	—
1924 Act—by Local Authorities ..	29,668	10,165
do. —by private enterprise ..	549	795
do. —by Public Utility Societies	77	50
Demonstration Houses	17	—
Steel houses erected on behalf of Government by Scottish National Housing Company	2,552	—
	88,013	16,071

Under the Addison scheme 25,129 houses were completed by local authorities. Houses by public utility societies numbered a trifling 421, and by private persons subsidised, 2324. Meanwhile the slum clearance schemes, entirely a local authority affair, have accounted for 8668 completions and 2683 under construction. The 1923 Act—that is, the Chamberlain Act—produced only 4006 by local authorities, but a large number by private enterprise—namely, 14,502 completed and 2378 under construction. Undoubtedly the Chamberlain Act gave a great impulse to private building. But the greatest impulse to local authorities has come from the 1924 Act—that is, the Wheatley Act—under which the local authorities have produced 29,668 houses, with 10,165 under construction. Under the same Act, private enterprise produced only 549, with 795 under construction. This is a great contrast to the working of the Chamberlain Act and the Wheatley Act in England. Taking all the Acts together, and including both the houses completed and under construction in 1928, Scotland has now 104,084. Knowing the enormous difficulties that confronted all building projects in Scotland when the Royal Commission reported in 1917, I can only regard this as marvellous progress; the pace will be steadily maintained until another 100,000 houses shall have been provided. Particular areas may be affected slightly by the phenomenal distress in the mining and iron trades; but probably this is a cause that operates adversely in England as well. It is worth remembering that the housing movement was initiated by representations from the mining areas of Lanarkshire in 1909. This led to several preliminary inquiries and surveys. The Royal Commission was not issued until 1912, and, owing to war delays, did not report until 1917. The first legislation on the report came in 1919. The Scottish Commission had stimulated England, and Dr. Addison, then Minister of Reconstruction, adopted at once the principal Scottish recommendations.

Public Health Services.

WHOOPING-COUGH.

To those in touch with the epidemic prevalence of whooping-cough it will come as no surprise to learn that since the beginning of the year there has been a definite rise in the incidence of the disease, the London County Council returns for the week ending Jan. 12th indicating that 1000 children were absent from the schools under their jurisdiction from this cause alone. That number may be compared with the similar weekly return of Dec. 8th, 1928, when 400 school-children were reported to be suffering from whooping-cough. Corroboration of the increased attack-rate will be found in the fact that on Jan. 30th of this year, in the Metropolitan Asylums Board hospitals for acute cases of infectious disease, there were 712 whooping-cough patients, or approximately 17 per cent. of the total numbers in these hospitals on that day. From these figures by themselves it is impossible to obtain more than a general idea of the true proportions of the epidemic, but it may be of interest to recall that only once has the above number been exceeded in the Board's hospitals since they were opened for the reception of whooping-cough in 1910—viz., on March 15th, 1927—when the cases of this disease under treatment numbered 789. The disease seems never to have completely disappeared during the summer months of 1928, and, as indicated by the hospital returns, there was an appreciable increase during the autumn months which, in turn, has been followed by a sharper rise in the admission rates since the beginning of this year. It is to be supposed that if the epidemic wave is following its usual course in London we are still 8–12 weeks removed from the period of maximum epidemicity, and it seems likely that a yet greater demand will be made on the resources of the hospitals. Should this coincide with an appeal for the removal of any large number of cases of influenzal pneumonia, the distribution of the available accommodation in accordance with the necessities of the situation will require considerable thought.

So far as can be observed at present whooping-cough is not showing any abnormal degree of severity in London, and this is reflected in the returns of the Registrar-General for the weeks ending Jan. 19th and 26th, in which we find 16 and 28 whooping-cough deaths respectively. It is interesting to speculate as to how far this improved figure is due to hospitalisation, a procedure which has now become current in public health work. Statistical evidence in support of this policy is very hard to come by, and is certainly not to be found even by the most intensive study of records of infectious hospitals by themselves, but no one with practical experience of this class of work can doubt that children from overcrowded, insanitary homes, during a period of stress such as that brought

bout by an attack of whooping-cough, have their hances of survival enormously increased by removal o a hygienic environment. At present, so far as reatment is concerned, this is the most that can be rovided for them, no specific remedy being available. Drugs without number have been recommended, ut few would be so bold as to claim consistent uccess with any. Recently ultra-violet radiation as been extolled, but the results await confirmation, nd preliminary work in this country has shown that his agent must be employed with caution lest dormant hest complications be stirred up. Abundant fresh ir and careful attention to the patients' nourishment re still the principal points in the treatment, whilst roncho-pneumonia must be dealt with on general ines. For the past few years workers whose interests ie on the bacteriological and clinical sides of the nfectious diseases common to this country have irected their attention mainly to the elucidation f problems opened up by the recent discoveries n diphtheria, scarlet fever, and measles. On the cientific side little that is new has appeared on the ubject of whooping-cough, and a fresh reconsideration f the whole problem from the bacteriological and mmunological standpoints is urgently called for.

INFLUENZA.

CLINICAL reports received from districts throughout England and Wales during the past week indicate that there is still considerable prevalence of influenza in Manchester, Oldham, Salford, Altrincham, Warrington, Wigan, Liverpool, and North-west Cheshire. Yorkshire and the rest of the North of England appear fairly free, as do the Midlands, with the exception of Derbyshire, Leicestershire, Newport (Salop), Hereford, and Coventry. It is reported from Bristol that fewer cases are occurring and the rest of the South and West of England shows no marked epidemic. The incidence in London appears to be rather sharply localised, Kilburn and Harlesden reporting large numbers of mild cases and Surbiton some incidence, while nothing noteworthy is reported elsewhere. A fair amount of the disease is occurring in Surrey and Berks. It is increasing in Cardiff, and epidemics are reported from Cwm Bran, Neath, Flint, and Denbigh.

In Glasgow the deaths reported during the week ending Feb. 2nd were 184 (a reduction of 52 on the previous week) and in Belfast there was a marked rise in the influenza mortality, the deaths numbering 105 as against 78 and 9 in the previous weeks. It was reported from the United States on Feb. 1st that influenza is decreasing in all parts. During the week ending Jan. 26th 55,000 cases were reported. The reports published by the Health Section of the League of Nations indicate no noteworthy change in the European situation. In Germany the returns for the Ortskrankenkasse indicate that the incidence is lower in Berlin, Breslau, and Leipzig, but increasing in Bremen. In Berlin the case mortality among the members was 3·3 per 1000, as compared with 2·4 in January, 1927. The only countries from which fresh reports of epidemic influenza have been received are Esthonia and Czecho-Slovakia; in both the type of the disease is mild.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 26TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 239; scarlet fever, 2582; diphtheria, 1427; enteric fever, 26; pneumonia, 2422; puerperal fever, 31; puerperal pyrexia, 113; cerebro-spinal fever, 5; acute poliomyelitis, 3; acute polio-encephalitis, 1; encephalitis lethargica, 22; dysentery, 16; ophthalmia neonatorum, 94. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 20 counties: London, 13 (of these St. Pancras 5, Wandsworth 4); Chester, 3 (Ellesmere Port and Whitby); Derby, 37 (of these Bolsover 23); Durham, 51; Essex, 11 (West Ham); Huntingdon, 1 (Norman Cross R.D.); Lancaster, 4; Leicester, 8 (County Borough); Lincoln, parts of Kesteven 5 (Stamford); Middlesex, 1 (Heston and Isleworth); Northampton, 7 (County Borough); Northumberland, 19 (of these Tynemouth, 18); Nottingham, 6 (of these Worksop (R.D., 5); Soke of Peterborough, 6; Stafford, 9 (of these Stoke-on-Trent 8); Suffolk, East, 1 (Stowmarket); Surrey, 2 (Mitcham, Wimbledon); Yorks West Riding, 33 (of these Castleford 14); Glamorgan, 10; Monmouth, 12.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Jan 29th–30th was as follows: Small-pox (46 under treatment, 1 under observation); scarlet fever, 1904; diphtheria, 2095; enteric fever, 14; measles, 54; whooping-cough, 712; puerperal fever, 26 (plus 11 babies); encephalitis lethargica, 77; poliomyelitis, 4; "other diseases," 50. At St. Margaret's Hospital there were 13 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 58 (0) from measles, 10 (0) from scarlet fever, 104 (28) from whooping-cough, 58 (15) from diphtheria, 40 (7) from diarrhœa and enteritis under two years, and 321 (77) from influenza. The figures in parentheses are those for London itself.

The number of deaths from influenza during the previous eight weeks was 56, 60, 61, 69, 83, 99, 122, and 179 respectively, the rate of rise being steeper in the last two weeks. The figures for London during the previous eight weeks have been as follows: 11, 10, 9, 9, 15, 18, 34, and 39 respectively. The deaths from influenza in the week under review again occurred largely in the Midland and Northern counties: Liverpool, 43; Manchester, 23; Portsmouth, 13; Warrington, 10; West Ham, Southampton, Sheffield each 8; Birkenhead, 7; Birmingham, Wallasey, Bolton each 6. Glasgow reported 236, and Belfast 78 during the same week. The two deaths from enteric fever outside London occurred at Bolton and Barrow-in-Furness. Liverpool reported 12 deaths from measles, Cardiff 7, Birmingham 6, and Gateshead 5. Whooping-cough deaths are much more evenly distributed over the country: Liverpool reported 8, Manchester 7, Leeds 5, Birkenhead, Warrington, Bolton, and Hull each 4. Manchester reported 4 deaths from diphtheria, Liverpool 6 deaths from diarrhœa.

The number of stillbirths registered during the week was 286 (corresponding to a rate of 43 per 1000 births), including 48 in London.

Death from Small-pox.—The fatal case provisionally classified to small-pox in the returns for the week ended Jan. 12th was that of a male patient, aged 65 years, who was admitted on Jan. 7th to the Small-pox Hospital at Halifax, where he died the following day. He was suffering from lobar pneumonia (left lung) and small-pox, and Dr. Wilfrid Smith, acting medical officer of health, writes that he considers the immediate cause of death was pneumonia. Small-pox was inserted on the death certificate as an additional cause.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. A. W. North to H.M.S. *Britannia* for cadets' duty at the R.N. Sick Quarters, Dartmouth.

ROYAL ARMY MEDICAL CORPS.

Capt. A. P. Draper to be Maj.

ARMY DENTAL CORPS.

Capt. J. S. Smith to be Maj.

TERRITORIAL ARMY.

Capt. D. R. Owen, from Active List, to be Capt.
Lt. C. E. Fenton to be Capt.
F. R. Curtis to be Lt.

INDIAN MEDICAL SERVICE.

Lt.-Cols. J. Masson and A. W. Greig retire.

Correspondence.

"Audi alteram partem."

BIOLOGICAL DIAGNOSIS OF PREGNANCY.

To the Editor of THE LANCET.

SIR,—The occasional great difficulty and importance of making the diagnosis of early pregnancy are so well recognised that any diagnostic test, that is said to be reliable, calls for serious consideration and examination. The latest such test, the Zondek-Aschheim test, promises to prove itself reliable, for the results of those who have tried it extensively indicate only a 2 per cent. incidence of error. This test, which was recently described in your columns,[1] depends on the presence of a hormone in the urine of the pregnant woman, which the original observers believe to come from the anterior lobe of the pituitary body; and any theoretical doubts, which may exist in the minds of some as to the identity of the hormone, do not affect the validity of the test. The urine is injected into immature mice, and the result depends upon changes which occur in the ovaries of the animals in the course of a few days, and which are recognisable by an expert both macroscopically and microscopically.

The only practical difficulty in the adoption of the test is the need of a suitable supply of test animals under the care of an expert. This difficulty has been overcome in Edinburgh by my colleague, Prof. F. A. E. Crew, of the Genetics and Animal Breeding Research Department, and in Mr. B. P. Wiesner, Ph.D. Vienna, a member of the staff, we have a distinguished expert with the available material. May I therefore inform the profession through your columns that in order both to test thoroughly the reliability of the Zondek-Aschheim reaction, and at the same time to be of help if possible in different cases, Prof. Crew and Dr. Wiesner are prepared and willing to employ the facilities of the department in regard to any specimen sent to it. The test is said to be valid from 14 days after the first missed menstrual period. All that is required is to send a few ounces of the patient's urine, with a covering letter containing the clinical and other data, to the Animal Breeding Research Department, King's Buildings, University of Edinburgh. It is proposed to charge a modest fee of 5*s.* in each private case, to cover the cost of the animals and other material, and this fee will enable similar tests to be made for the reduced fee of 1*s.* 6*d.* in all hospital cases referred to the department. The result of the test will be notified by post to the sender about a week after the urine is received.

The help which the test has already afforded to me in several cases in the last three months leads me to believe that in throwing their facilities open to the profession in this country Prof. Crew and Dr. Wiesner are offering us very great practical assistance, and I hope that many of my colleagues will take advantage of these arrangements.

I am, Sir, yours faithfully,

R. W. JOHNSTONE.

University New Buildings, Edinburgh, Jan. 31st, 1929.

ASTHMA RESEARCH.

To the Editor of THE LANCET.

SIR,—My letter was not an advocacy of any method of treatment—I know too little for that—but quite definitely a plea for the serious consideration of the psychological aspect of asthma in any scheme of research. I now quite accept the fact that Mr. Coke, as a biochemical expert, does not believe that psychopathology has anything to offer towards the understanding of the problem of asthma.

His defence of the "stigma" upon the neurotic, the nervous, or the neuropath (I use his terminology in humble ignorance of the clinical or pathological differences it implies) has a frankness that makes clear the danger of moral judgments as scientific or diagnostic criteria. Let me repeat his argument, substituting "asthmatic" for the words of opprobrium: "If the number of asthmatics in the world were doubled, the health of society at large and the peace of the individual at home would be very adversely affected; if it were halved, the nation would be far happier. Therefore, the asthmatic is not an element for good, and in so far as he fails to add his quota to the general happiness of the world, so far is he a nuisance, and so far do his asthmatic manifestations carry a stigma." There seems no flaw in the argument, thus presented, that does not equally apply to the original.

Mr. Coke should study "Erewhon," where he will find described a country where emotional disturbances, though classed with delinquency, were openly treated as disease, whilst physical disorders were concealed as disgraceful; measles meant imprisonment, toothache was despicable, and asthma might have led to permanent detention. This bitter sarcasm of the neurotic Samuel Butler, whose books still give pleasure to many readers, prompts the wish that he were alive to answer Mr. Coke with an argumentum ad hominem. The shade of Dr. Johnson, a sufferer from neurotic, nervous, or neuropathic obsessions and inhibitions, might find words suitable to the occasion; or we might invoke the literary aid of Thomas Carlyle, who with his sound-proof chamber was as much a nuisance as any physical invalid. The gentle Elia, with his neurotic stammer, would be too diffident for the task, but Lord Roberts might in military fashion defend the thesis that a cat phobia is as respectable as a cat asthma and equally a concern of medicine.

But the shades of these eminent neurotics might shrink before the moral disapproval of Mr. Coke and even, as many neurotics in the flesh certainly do, keep their symptoms to themselves when they scent it. He tells us that he is not totally ignorant of psychotherapy, and speaks of useful conclusions arrived at by sympathetic questions. May we try to imagine a psychopathologist "stirring up the deeper pools of memory with a long stick and grabbing the dead leaves as they come to the surface" together with a companion picture of Mr. Coke sympathetically questioning a neurotic whom he is about to stigmatise?

"When the patient said that cats gave him asthma he was disbelieved; now, by means of the skin reactions, full justification of his statement is possible." Who disbelieved him? What is Mr. Coke's attitude to the man who says that cats make him physically ill with terror? Is this sufferer to be disbelieved, despised, and stigmatised because his reaction takes a shape for which Mr. Coke cannot find a biochemical formula? Or shall we as scientific men seek whether we can learn anything from the study of these curiously related conditions?

I am, Sir, yours faithfully,

MILLAIS CULPIN.

Queen Anne-street, W., Feb. 3rd, 1929.

To the Editor of THE LANCET.

SIR,—One is inclined to agree with Mr. Frank Coke that his views on psychology are not likely to be interesting, not at the present stage of his education; but it is otherwise with his ideas about the "science of psychotherapy" of which he claims that he is not ignorant. As a practical man I for one should like to hear more of this scientific psychotherapy which is apparently founded on disbelieving the patient. "Neurotic tendencies," he says, "were wrongly imputed to the asthmatic in the past by a profession which was totally ignorant of the main causes of asthma as now recognised. When the patient

[1] THE LANCET, 1928, ii., 834.

said that cats gave him asthma, he was disbelieved." The old Adam in myself often makes me want to doubt the patient, but I should humbly suggest to Mr. Coke that the beginning of psychological knowledge is founded on believing that what the patient says is true.

Mr. Coke with his bright optimism has much contempt for the unhappy neurotic, and he gives his reasons. Here, perhaps, a book on logic will help him more than one on psychology. Every word he says of the neurotic is equally applicable to the sufferer from any illness whatsoever. I venture to parody his words with the one substitution of the word "sick" for the word "neurotic" or "nervous." Thus: "If the number of sick in the world were doubled, the health of society at large and the peace of the individual at home would be very adversely affected; if it were halved, the nation would be far happier." No one will dispute so obvious a proposition. Let us therefore add his conclusion. "Therefore, the sick man is not an element for good, and in so far as he fails to add his quota to the general happiness of the world, so far is he is a nuisance, and so far do his sick manifestations carry a stigma."

Is it a book on logic, however, or a little common charity that is wanted?

I am, Sir, yours faithfully,

T. A. Ross.

The Cassel Hospital for Functional Nervous Disorders, Penshurst, Kent, Feb. 2nd, 1929.

VACCINATION AGAINST SMALL-POX.

To the Editor of THE LANCET.

SIR,—In your account last week (p. 231 et seq) of the recent discussion on vaccination against small-pox, I am made to say in the course of my reply that we have not got an efficient vaccine virus. What I did say was that we had not got an efficient *killed* vaccine virus and that, while further research towards the securing of a modified virus capable of yielding protection against small-pox was eminently desirable, experimental investigations hitherto conducted had given small grounds for optimism.

I am, Sir, yours faithfully,

J. C. G. LEDINGHAM.

Lister Institute, London, Feb. 4th, 1929.

To the Editor of THE LANCET.

SIR,—Referring to the discussion of the Section of Epidemiology of the Royal Society of Medicine (reported in your columns last week), I venture to doubt whether "alastrim" has been proved to be such a stable variant of small-pox as some of the speakers supposed. According to Dr. Rajchman, it made its appearance in England in 1919; but the late Dr. J. C. McVail pointed out in the Milroy Lectures for that year that two sorts of small-pox had been prevalent in England since about 1902, a severe form in London, and a milder form in the provinces. The fatality of the mild form was 6 or 7 per cent., of the severe, from 12 to 25. A very notable fall in the provincial fatality occurred in 1921, when it was only 1·4 per cent. Since that year it has dropped still lower. Is the present-day mild small-pox (alastrim) a direct descendant of Dr. McVail's mild, provincial form, or is it a later imported variant? And if alastrim is a stable variant, was Dr. McVail's mild form also a stable variant? I observe that Dr. Monckton Copeman stated that the alastrim he saw in 1903 in and about Cambridge was of a more severe type than in most of the recent outbreaks. It appears, therefore, that during the past 28 years there have been present in this country at one time or another two, if not three, varieties of mild small-pox, besides the classical, more or less severe, form.

It is interesting to note that a similar question of identity of disease has arisen during recent years in the cases of typhus and scarlet fever. Prof. Ledingham said that "he thought that sufficient consideration had not been given to the possibility that the virulent form of small-pox had been somewhere incident alongside the alastrim, but without definite transitions." I quite agree with his opinion. So far as I am aware the two forms have not, in this country, been prevalent together at the same time in the same place. It would be a crucial test for those who believe alastrim to be quite a different disease from small-pox, to place cases of each disease together in the same ward of a hospital to observe whether patients suffering from the one became infected by the other. It is stated in the *Monthly Epidemiological Reports* (Feb. 15th, 1928) issued by the League of Nations that "small-pox of severe type appeared in June, 1927, in Northern Rhodesia, where ordinarily only the mild Kaffir-pox is met with. During the first 20 weeks of 1927 140 cases with only 4 deaths were reported, giving a case mortality-rate of 2·9 per cent.; between the twenty-first and the fiftieth week of that year there were 856 cases and 170 deaths, giving a case mortality-rate of about 20 per cent."

The questions arise, was Kaffir-pox (amaas) replaced by severe small-pox or did the former change into the latter, or did the two run side by side? Perhaps the report of this discussion will be the means of eliciting information on this point. According to the latest returns small-pox has become less frequent and less severe again in Northern Rhodesia. With this history before us we should not assume that the present mild form in England may not at any time become more severe or be replaced by a more dangerous form.

I am, Sir, yours faithfully,

E. W. GOODALL.

Hemingford Abbots, Hunts, Feb. 4th, 1929.

MYOFIBROSITIS.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Neave's inquiry as to the evidence which supports the view that fibrositis is really the cause of the symptoms which are usually attributed to it, the following points may be mentioned. In 1904 when Sir William Gowers[1] in a lecture on "Lumbago: its Lessons and Analogues" first suggested the use of the word "fibrositis" for the malady, he regarded it as an inflammatory lesion of the fibrous tissue but admitted that "at present we are without any direct evidence of the real nature of these affections, such as can only be furnished by microscopes and modern methods of discerning that which it reveals." This evidence was supplied soon afterwards by Prof. R. Stockman[2] who stated that "the lesion consists in inflammatory hyperplasia of the connective tissue in patches." He and Dr. C. J. Renton demonstrated that microscopic examination of nodules excised during life showed a "localised inflammation of the perimysium," in short, a fibrositis. The microphotographs which illustrate his paper show clearly this condition.

I am, Sir, yours faithfully,

Manchester, Jan. 29th, 1929. GEORGE R. MURRAY.

SUBMUCOUS RESECTION OF THE NASAL SEPTUM.

To the Editor of THE LANCET.

SIR,—I am much interested in your annotation last week (p. 244) on this operation, the most valuable in rhinology. So much sense and so much nonsense have been written concerning it that one finds extremists stating that they "have never seen any good come of the operation" and others who cannot admit failure. Recently I wrote[3] upon the Essentials

[1] Brit. Med. Jour., 1904, i., 117.
[2] Edin. Med. Jour., 1904, xv., 108.
[3] Practitioner, September, 1928.

of Septum Operations and, as I have performed over a thousand of these operations, I may claim to be entitled to an opinion and to be permitted to recapitulate briefly what I consider to be these essentials. The factors which count for success are good illumination, a skilled anæsthetist accustomed to coöperate with the operator, careful preparation of the nose, thorough operation, and an after-treatment entailing as little interference as possible. I may add that I prefer general anæsthesia as affording more freedom in operating. I have also long been accustomed to operate in the sitting or, occasionally, in the semi-recumbent position.

The greatest care of the muco-perichondrio-periosteal flap is essential, together with thorough separation and isolation of the bony cartilaginous septum. For the palatal crest I have long discarded chisel and gouge in favour of Huff's cutting forceps, which are neater, clean-cutting, and more easily controlled. Failure is often due to not removing enough of the septum, but due regard to the preservation of an anterior buttress to support the nasal bridge must be taken. Enlarged posterior ends of inferior turbinates should always be removed when present; failure to do so seriously militates against effective operation. Plugging for 24 hours is another essential, and compressed gauze, cut into suitable splints, well coated with sterilised vaseline, and carrying anterior loops of flat "French braid" for their easy removal, is best for this purpose. The absorption of moisture swells these splints and ensures effective pressure on the new septum, making sutures unnecessary. I have never seen a "flapping septum" in my cases since I used them. As regards after-treatment, nasal washes, forcible blowing through the nose to clear the passages, and other meddlesome methods are provocative of complications and disaster, and it is foolish to permit the patient to leave the nursing home before a week has elapsed.

I am strongly of opinion that if these essentials be adhered to bad results will be reduced to a minimum. At this stage of my experience I can say that such bad results as I have encountered occurred in my early days of operation. The procedure calls for experience and technique of a high order, and not even the best of us can avoid occasional failure. We can, however, take no risks, and when failure occurs in spite of every care, it will be found to lie in the non-recognition of some general condition of the patient.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Wimpole-street, W., Feb. 4th, 1929.

"INDUCED" COUGH IN DIAGNOSIS.

To the Editor of THE LANCET.

SIR,—Among the many instructive precepts emerging from Dr. S. Vere Pearson's address on Pitfalls in the Diagnosis of Pulmonary Tuberculosis in THE LANCET, Jan. 12th, and from the correspondence following it, I see no reference to the value of the "induced" cough. In many cases in which the sputum provided by the patient has proved negative, an "induced" cough has provided a positive one and has enabled the physician to embark confidently on the appropriate course of treatment. There are various methods by which a useful cough can be "induced," which I have so recently set out in your correspondence columns,[1] under the heading "Obtaining a Specimen of Sputum," that I need not repeat them here. Possibly such methods are frequently employed, but they have not received the attention I think they deserve, and I offer them as a small contribution towards the avoidance of pitfalls in the diagnosis of early tuberculosis of the lungs, as I have found them in early tuberculosis of the larynx.

I am, Sir, yours faithfully,

London, Jan. 28th, 1929. JAMES DUNDAS-GRANT.

[1] THE LANCET, 1928, ii., 679.

THE TREATMENT OF HÆMORRHOIDS BY INJECTION.

To the Editor of THE LANCET.

SIR,—Mr. Morley accuses me of misquoting. I therefore give the exact text of the official report which followed the proctological meeting at the Royal Society of Medicine on July 9th, 1924—i.e., the paragraph relating to the general opinion expressed on the submucous injection treatment of hæmorrhoids:—

"The general opinion, after a full discussion, was that in selected uncomplicated cases definite improvement could be promised, and in some cases permanent cure was effected, but the likelihood of recurrence in perhaps 50 per cent. of the cases indicated the necessity for periodical re-examination and further injection as required."

I fail to see in what way I misrepresented the gist of the matter in the words I used in my letter to you.

Mr. Morley does himself an injustice. I read very carefully his book on Hæmorrhoids (1923) and I find on p. 54:—

"However, my objections to all these solutions are more or less theoretical, because my results with the 20 per cent. solution of carbolic in glycerine and water have been so uniformly satisfactory that I have resisted temptation to experiment with any others, &c."

Why, then, if Mr. Morley's results were then so uniformly satisfactory do we now find him using the very weak preparation of 5 per cent. phenol in almond oil? The curious point is that on the same page (54) of his book Mr. Morley writes: "I should not feel very confident of injecting an oily solution, because, etc." But Mr. Morley in this book also expresses the opinion that a 10 per cent. solution of phenol is too weak (also p. 54); so that one feels bewildered at the various changes in Mr. Morley's opinions.

In his letter last week criticising my subsidiary article on the Treatment of Hæmorrhoids by the Galvano-cautery (*British Medical Journal*, Dec. 8th, 1928), Mr. Morley uses the words "alarming list of complications." Yet my paragraph on complications starts with the words "These, fortunately, are very rare"—and I leave to your readers to decide whether or not this is fair comment. When my statistics are published Mr. Morley may be surprised. From memory I should say that the cures, after three years and upwards, will work out at something like 99 per cent., including all cases without any selection.

I am, Sir, yours faithfully,

W. S. WHITCOMBE.

Harley-steeet, W., Feb. 4th, 1929.

ABERGELE SANATORIUM.—As a result of representations put before the Ministry of Health by a deputation from the Finance Committee of the Manchester Corporation, it now seems probable that the Manchester Corporation will get the full grant (about £14,000) towards the cost of the sanatorium erected by the corporation at Abergele. The town clerk has received a letter from the Ministry of Health stating that the Minister is disposed to think that he would be justified in proposing that such special provision should be made.

MEDICAL REUNION IN PARIS.—A medical reunion will be held in Paris from June 9th to 14th; it will be organised with the coöperation of the *Revue Médicale Française* and its contributors, and will be open to medical men and students from all countries. The constitution of the Central Committee is as follows: President, Prof. Delbet; Vice-Presidents, Prof. Sergent and Prof. Desgrez; general organiser, Prof. Balthazard; general secretary, Dr. Léon Tixier; assistant general secretary, Mr. Deval; treasurer, Dr. Léon Giroux. The meetings will be held in the Palais des Expositions, Paris (Porte de Vaugirard), where an exhibition will be organised. During the afternoons various addresses will be given. In the mornings a well-considered programme has been drawn up, which provides for attendance at practical demonstrations at the clinics of the Faculty of Medicine and in the public and private hospitals and scientific institutes. Further particulars may be obtained from Mr. Léon Tixier, 18, Rue de Verneuil, Paris (7e).

Obituary.

SIR ALEXANDER OGSTON, M.D. ABERD., K.C.V.O.,

LATE REGIUS PROFESSOR OF SURGERY IN THE UNIVERSITY OF ABERDEEN.

ON Feb. 1st the medical profession lost by the death of Sir Alexander Ogston an eminent surgeon and a veteran leader. He devoted his life to the promotion of scientific surgery, realising throughout that the medical profession, if it were to serve properly the public needs, alike in civil and military circumstances, must be properly organised, so that evolving professional knowledge could be rendered available in a prompt and orderly way.

Ogston, who was 84 years of age at the time of his death, had been living in retirement for some years. He was the eldest son of Prof. Francis Ogston, professor of forensic medicine at Aberdeen, and was educated at his home University, where he graduated M.B., C.M. in 1865, being then just short of his twenty-first birthday, while he also attended a certain number of medical courses in Glasgow. He then made a prolonged continental tour, obtaining post-graduate instruction at Paris, Vienna, and Berlin, proceeded to the degree of M.D. at Aberdeen with the shortest possible interlude, and went abroad again to follow up various studies in the leading medical schools. With such a grounding and substantial family introductions, success came rapidly to him on return to his native city, and we are reminded by what actually occurred of the all-round capacities expected of and displayed by the promising young doctors 60 years ago. Ogston's ophthalmological work in foreign clinics obtained for him almost immediately the position of ophthalmic lecturer in the University of Aberdeen; at the same time he made a promising start as a general operating surgeon; while from 1866 to 1873 he acted as assistant to his father, specialising in medical jurisprudence. Nor did this round off his energies, for from 1868 to 1872 he was joint medical officer of health for Aberdeen, in the latter year being superintendent of the Small-pox Epidemic Hospital set up in the city. In 1870, while still lecturing on ophthalmoscopy in the University, he was appointed junior surgeon at the Royal Infirmary, and four years later became full surgeon, reaching the position of senior in 1880. He was senior surgeon to the Royal Infirmary for the following 18 years, when he was appointed consulting surgeon. This extended connexion with the infirmary synchronises, it will be seen, with the enormous revolution in surgery brought about by Lister's discovery, for Ogston served his apprenticeship in those days, so often described in lurid terms, when hospital wards, despite the skill of individual surgeons, were nests of foulness. The new and fundamental knowledge came in time for those who could seize immediately upon its meaning, and Ogston began at once to display his qualities as a successful operator on modern lines, and was actually a pioneer in the pathology of septicæmia, as is shown below in Prof. Bulloch's estimate of his teacher. With the extended range of surgery made possible by the Listerian methods, Ogston became a fine operator; he specialised in bone surgery and for a long time "Ogston's Operation" was the classic procedure in genu valgum. In 1882 he was appointed Regius Professor of Surgery in the University and held this post for 27 years, retiring in June, 1909, an event which was celebrated by the presentation of public addresses and of portraits by Mr. Fiddes Watt painted, one for the University, and one for the Ogston family.

SIR ALEXANDER OGSTON.

Morgan Studios.

In the public eye Ogston was closely identified with military surgery, and for very good reason. His experience here must have been unique for one whose extensive and varied service in the field was unsupported by any special training as a military officer. His interest in the training of medical men for service in the fighting forces was unceasing, and he was acclaimed by a well-known Director-General of the Navy as "the first pioneer in dealing with the medical conditions prevailing in the Army and Navy in modern times . . . work he did without fee or reward." In his own book, entitled "Reminiscences of Three Campaigns," we have his experiences of the Franco-German War (1870–71), the Egyptian War (1884–85), and the great European War, while he also saw service in the South African War. What he saw in the first two campaigns made of him a severe critic of the existing military and naval organisations, and some of the experiences which he gathered in the last decade of his life in Serbia, and later in Italy, appeared to him to support his earlier opinions. It was particularly in the Egyptian War that he had first-hand opportunities of mastering the details of military surgery, and for his services and personal bravery he was awarded the Khedive's Bronze Star and the Egyptian war medal. He was elected member of the Committee of Medical Experts appointed by the Government in 1901 for the future organisation of the Royal Army Medical Corps, the appointment being determined by his publicly expressed opinions at the annual meeting of the British Medical Association at Portsmouth, some two years previously, on the inefficiency of the R.A.M.C. Thirteen years later, although already over 70 years of age when hostilities broke out, he made unceasing efforts to get to the front, and actually succeeded in seeing active service in Serbia, and discharging important duties with the Italian Army. His experiences, therefore, gave him a right to hold fine opinions on the right way to secure medical officers to minister to the Navy and Army, and while his great scheme for removing these officers from departmental control received no general support, many of his suggestions have been adopted.

Prof. WILLIAM BULLOCH writes:—"The announcement of the death of my old and revered teacher, Alexander Ogston, has prompted me to place on record a modern appreciation of his pioneer bacteriological work on inflammation and suppuration. It is not generally recognised that many of the current doctrines of infection and metastatic generalisation of bacteria really emanated from him. Prior to 1880 there was a condition bordering on chaos with regard to the nature of the conditions which were described as septic infection, pyæmia, and septicæmia. As late as 1879 the Pathological Society of London held a prolonged inquiry on the subject and showed that our knowledge was in the highest degree incomplete and the opinions discordant. The modern views of the relation of putridity to septicæmia were developed by Koch (1878) in his small but epoch-making book on the 'Ætiology of Traumatic Infective Diseases.' This work, written while Koch was still a practitioner

in Wollstein and far removed from academic influences, is a landmark in bacteriology. Koch's object was to determine whether infective processes in wounds were parasitic or not. He had to confine himself exclusively to animal experiments, but was able to show in a manner amounting almost to proof that a series of diseases differing clinically, anatomically, and ætiologically can be produced experimentally by the injection of putrid fluids into small animals. Koch used methods of investigation which were then new. Fluids and tissues were stained by anilin dyes and the films and sections were examined by the aid of the illuminating apparatus devised by Abbé, in combination with the admirable oil-immersion lenses made by C. Zeiss.

"The application of these methods had an enormous and lasting influence in the development of bacteriology. Although Koch's original intention was to study the infection of wounds in man, he was not in a position to do so and thus a considerable hiatus was left in his work. This hiatus was filled in an exact fashion by Alexander Ogston, at that time (1880–81) assistant surgeon in the Aberdeen Royal Infirmary. Following Koch's technique exactly, Ogston examined for bacteria over 100 abscesses, of which some were 'cold' but most were 'acute.' No micro-organisms could be found in the former, whereas in all the latter, micrococci were demonstrated and were found to be arranged either in groups like the roe of fish or in chains. He showed that this difference in appearance was due to a fundamental difference in the mode of fission. By patient hæmocytometric studies he estimated the proportion of the pus cocci to the pus corpuscles. He described and figured the occasional occurrence of bacteria other than cocci in abscesses, and described, for example, fusiform bacilli and spirochætes in alveolar abscesses long before they were noted by others. By experiments on mice Ogston then showed that pus which contained cocci could produce abscesses, and in the resulting pus he found, by means of the hæmocytometer, that the cocci had greatly increased in numbers. Pus heated or treated with phenol had no power to produce inflammation. He was therefore led to believe that the cocci were actually alive—a point which at that time was not universally accepted. Ogston made over a hundred attempts to cultivate the cocci in vitro and tried aerobic and anaerobic conditions. He ultimately succeeded best with cultures made in eggs and showed that these cultures were capable of producing abscesses in animals. From these experiments he formulated certain general conclusions. He considered that at first the cocci proliferate locally and may invade peripherally. They may even pass into the blood. In abscesses they were excluded by the formation of a deliminating wall of granulation tissue which arrested their further spread.

"In 1882 Ogston published further conclusions on 'micrococcus poisoning.' He herein emphasised the difference between the chain and group cocci. For the former he retained Billroth's name 'streptococcus,' and for the latter Ogston introduced (at the suggestion of W. D. Geddes, the professor of Greek in Aberdeen) the name staphylococcus. Ogston connected local coccal infections and spreading phlegmons ending in pyæmia and septicæmia as part and parcel of the same process and as being due to differences in degree rather than quality. He opposed the prevailing view that pyæmia and septicæmia were 'blood' diseases, and showed clearly that blood was merely the vehicle which may generalise in the body what without its aid would be only a local process. Ogston contended that pyæmia and septicæmia were the sequence of local foci of micrococcus growth and were merely the expression of the malign influences coming from this source. In his opinion the variations in the course and termination of infective processes were brought about by differences in the microbes, their virulence, the organ or structure involved, and the susceptibility of the individual affected.

"Ogston's publications, advanced and original as they were, rapidly exerted an influence on the surgical, bacteriological, and pathological teaching on inflammation and suppuration. Lister (1881) opposed some of Ogston's views, but the latter defended himself skilfully with new arguments and, as it happened, practically every word he wrote has turned out to be correct and is accepted teaching of to-day. Ogston's work on 'micrococcus poisoning' was remarkable not only from its accuracy of observation, but also from the correct interpretations which he made. As the science of pathogenic bacteria was gradually emerging between 1876 and 1886, almost nothing was done on the subject in England. France and Germany were very active and the technical methods of Koch were leading to a marvellous harvest of results. Apart from David Bruce's discovery of the agent of Malta fever, and that was of a later date, Alexander Ogston was the only worker in England who now finds a permanent place in the history of pathogenic bacteriology in its classical period. His observations and views have all passed so much into common knowledge that only his death in 1929, half a century after his work was published, serves to remind us of the man who correctly interpreted the exact ætiology of acute suppurative processes in man."

Inevitably Sir Alexander Ogston in the course of his long and distinguished career received many honours. He was Surgeon in Scotland to Queen Victoria and King Edward VII., and Surgeon-Extraordinary to the present King; he was an LL.D. of the Universities of Glasgow and Aberdeen; an ex-President of the B.M.A., a Knight of the Order of the Crown in Italy, D.L. for Aberdeenshire, and in 1912 was created K.C.V.O. He was twice married, first to Mary Jane, daughter of Mr. James Hargreave, by whom he had two sons and two daughters, and secondly to Isabella, daughter of the late James Matthews, Lord Provost of Aberdeen, by whom he had four sons and four daughters.

JOHN OWEN, M.D., F.R.C.P. LOND., D.P.H. CAMB.

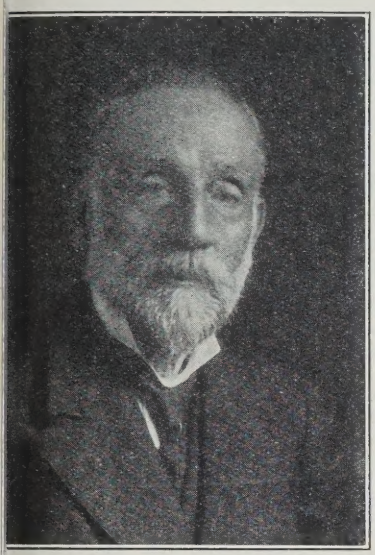
By the death of Dr. John Owen, who succumbed on Jan. 31st to an acute attack of pneumonia, Liverpool loses one of its best known physicians. Born in 1871, John Owen was educated at the Beaumaris Grammar School and at the University Colleges of Bangor and Liverpool, proceeding to Guy's Hospital for his medical training. He qualified M.B. Lond. in 1897, becoming M.D. in 1906, M.R.C.P. in 1908, and F.R.C.P. in 1923. He returned to Liverpool on qualification to a post at the Royal Southern Hospital and then started in general practice, but on the outbreak of the South African War he joined the staff of the Portsmouth Military Hospital as civil surgeon and later served in South Africa. On his return he held a post as medical officer to St. Pancras Dispensary before returning to Liverpool as consulting physician. He became attached in an honorary capacity to various hospitals and institutions, including the Liverpool Royal Infirmary; the Home for Epileptics, Maghull; the Eye and Ear Hospital, Liverpool; Southport Infirmary; and the Liverpool Hospital for Consumption and Stanley Hospital, and was at one time physician and pathologist to the Northern Hospital. He was also lecturer in clinical medicine at Liverpool University. Dr. Owen served in India and Mesopotamia during the Great War, retiring with the rank of Major in the R.A.M.C. Territorial Force and the Territorial Decoration. He was as renowned as a physician as he was liked as a man. His sympathy with patients and steadfast loyalty to his colleagues endeared him to all who knew him. He was interested in neurology as well as in the heart and lung, and was keen to detect unusual symptoms and to appreciate diagnostic points. His death will be regretted by all who came under his influence at the Liverpool Medical School and elsewhere.

FRANCIS DE HAVILLAND HALL, M.D., F.R.C.P. Lond.,

CONSULTING PHYSICIAN TO THE WESTMINSTER HOSPITAL.

We announced last week the death, after a short attack of pneumonia, of Dr. Francis de Havilland Hall, which occurred at his house at Twickenham on Sunday, Jan. 27th, in his eighty-third year.

Few physicians in London were better known to his colleagues throughout an extended period of consulting practice than de Havilland Hall. He was born in Hatfield on April 10th, 1847, the son of Dr. W. Hall, and after general education at Bruce Castle School, Tottenham, received his medical training at St. Bartholomew's Hospital. He qualified as M.R.C.S. Eng. and L.S.A. Lond. in 1868—the usual double qualifications at that date—and graduated in medicine in the University of London in the following year. At St. Bartholomew's Hospital he held the regular residential posts, and was then appointed casualty physician, being also elected assistant physician to the Metropolitan Dispensary. For a brief time he went into general practice, but at this point his association with Westminster Hospital started, and continued for over 40 years. In 1876 he was elected medical registrar at the institution, and almost immediately afterwards assistant physician in charge of the throat department, his contemporaries being, among others, Octavius Sturges, William Allchin, J. B. Potter, and Bryan Donkin. The result of his laryngeal work was evidenced by a short volume which he published in 1878 entitled a "Synopsis of the Diseases of the Larynx, Lungs, and Heart," but Hall was not only a specialist. In one direction, in particular, he displayed his all-round capacity—namely, by his work in connexion with life assurance. He became medical officer to the Law Union and, later, to the Rock Insurance Companies, and was particularly conversant with the special and general problems presented by this side of medicine. He served as President of the Assurance Medical Officers' Association, and throughout his long professional career was regarded rightly as an authority upon the principles of life assurance, while his manual entitled "The Medical Examination for Life Assurance" ran through three editions. His other writings were mainly the outcome of his charge at Westminster of the throat department of the hospital, for he contributed articles on diseases of the larynx and nose to Fowler's "Dictionary of Practical Medicine," and those on diseases of the nose and throat to Allbutt's "System of Medicine"; but he wrote upon diseases of the mediastinum in the "Encyclopædia Medica," and on diseases of the pleura and mediastinum in Allchin's "Manual of Medicine." All these contributions to medical literature were valuable because they were based upon long personal observation, but his work on the larynx and throat formed his principal claims to attention, and he was one of the original members of the old Laryngological Society. He served for no less than 20 years as assistant physician to the hospital, becoming full physician in 1896 and consulting physician in 1912.



DR. DE HAVILLAND HALL.

Elliott and Fry.

De Havilland Hall's association with the Royal College of Physicians of London was a close one. He obtained the M.R.C.P. while still at St. Bartholomew's Hospital, was elected F.R.C.P. in 1881, was Censor from 1908 till 1911, was an examiner in medicine for the licentiateship, and in 1913 delivered the Lumleian lectures when he took as his subject intrathoracic aneurysm. The lectures, which were published in THE LANCET, formed a scholarly and comprehensive history of the disease up to the date of delivery, and were based alike upon his own work and an evaluation of that of his predecessors and colleagues.

Mr. W. McAdam Eccles writes: "My friendship with Dr. de Havilland Hall was enhanced by mutual association with insurance problems. His opinion thereon was eagerly sought for, and almost universally acted upon. His long connexion with the Rock Insurance Company, and afterwards the Law Union and Rock, entitled his conclusions upon difficult questions to be listened to with respect. It was in connexion with the Life Assurance Medical Officers' Association (which later became the Assurance Medical Society) that he specially shone. He had read various papers before the Society, and seldom missed a meeting, generally adding considerable zest to the discussions by his cogent remarks upon the matter under review. In 1912 he was elected President of the Society, holding office for two years with great grace and energy. Some of the remarks which have fallen from him are almost in the nature of epigrams, and are worthy of quotation:—

> I have never been able to explain why so many of these obese people do not seem to be large eaters. I suppose really their digestive system is so thoroughly efficient that they assimilate all the nourishment they take, whereas lean people perhaps have not the same powers of assimilation.

> In the case of ——, who was operated on for chronic appendicitis, calcified mesenteric glands were found. His abdominal "Stonehenge" was doubtless due to old tuberculosis, but he has since remained in good health.

> I would insist on the use of the sphygmomanometer "in all applicants above the age of 50" (1912); now (1921) I should say over 40.

Mr. Walter Spencer, in an appreciation of a senior colleague, comments upon de Havilland Hall's long service at Westminster as an out-patient physician. "In consequence," he writes, "de Havilland Hall was led to adopt what became characteristic of his teaching—precise detail as to medical treatment and prescribing, categorical instruction after the manner an examinee must answer questions, various modifications of hospital practice necessary in private practice. Continued later in the wards, this system of teaching, in particular to students having general practice in view, by a physician of experience, was more beneficial than is such instruction in tutorial classes by junior colleagues. . . . Until he became full physician he conducted the laryngological department and with his close friends, Butlin and Felix Semon, was one of the founders of the Laryngological Society. He wrote a popular text-book, 'Diseases of the Nose and Throat,' and when a new edition was called for Mr. Herbert Tilley joined him and added much on surgery. The loss of de Havilland Hall from the consulting staff of Westminster Hospital, following immediately upon that of Mr. William Wroughton from the committee, has removed the last of the personnel as it existed when I was appointed 42 years ago—Hall kept up a continuous intimacy with many members of the St. Bartholomew's staff and I owed much to him for the introduction he gave me on my election. Throughout our time together we corresponded, physician with surgeon. He was quick in

coming to a diagnosis that a case would be benefited by medical treatment. Alternatively he was prompt and on very many occasions gave me the opportunity of operating early. His optimistic temperament had in recent years great trials. Chronic diabetes had to be kept in check and his personal tendency to abstemiousness both as to food and drink had to be yet more rigidly observed. Then came personal anxieties during the war, and then the sudden death of his special friend, Frederick Palmer, deprived him of the companion of his weekly walks. Finally, malum coxæ senile gave him much pain. When last we met, about a month ago in the board room, he with two sticks, hardly able to hobble a hundred yards, was still his cheerful self, reminiscent, and hopeful that the pain was passing off."

Dr. LINA POTTER, the daughter of Dr. de Havilland Hall's late colleague and intimate friend, writes: "Looking back on the man one feels that the keynote of his personality was size—he was large in mind as in his tall loose-made frame, and he was large in his appreciation, being easily noted in a crowded meeting for his hearty laugh and cheery bearing. He never said an unkind thing, an attitude due to no restraint of tongue but to the fact that he never had an unkind thing to record."

These excerpts from communications which we have received give a good picture of a man to be admired and regretted, and two directions may be mentioned in which he showed his great kindness, his love of his profession, and deep sympathy with his fellow practitioners. He was the President of the Society for the Relief of Widows and Orphans, and as a medical man was deeply interested in the prosperity of the Society and assiduous in bringing its advantages before his colleagues. He was also for 25 years on the Council of Epsom College, vice-chairman for three years, a regular attendant at the meetings, and until a few weeks ago was chairman of the selection committee for ten years. No voice was listened to at the Council with more respect than his, for his judgments were those of a fair but absolutely generous man.

Dr. de Havilland Hall married Amy Margaret, daughter of Apsley Smith, of Rusthall, Tunbridge Wells, and is survived by his widow, one son, and three daughters.

JOHN EDWIN EDDISON, M.D. EDIN., D.SC.

BY the death of Dr. Eddison, which took place at Cuckfield, Sussex, after 20 years' retirement from active practice, there passes one of the older generation of Leeds consultants who for many years took a leading position in the professional and intellectual life of the city of his birth.

John Edwin Eddison was born in 1842 at Headingley, the son of a well-known solicitor in Leeds. He received his medical edication at the University of Edinburgh, where he was greatly impressed by the thorough clinical teaching of Hughes Bennett and George Balfour. He graduated in 1864, taking the M.R.C.S. Eng. in the same year. He then studied in London and, for some little time both in Paris and in Vienna, before beginning practice in Leeds. From the first his aim was to be a consulting physician, and he got his chance towards the end of the seventies when Charles Chadwick, who was at that time senior physician to the General Infirmary, resigned, and Eddison was appointed to the staff, becoming junior colleague to J. D. Heaton and Clifford Allbutt. Some of the other medical charities of Leeds also had the benefit of his services; he was physician to the Public Dispensary, to the Women and Children's Hospital, and to the "House of Recovery," one of the first fever hospitals to be opened in this country, where diseases such as typhus and relapsing fever, now almost extinct, came under his notice frequently.

Eddison served the General Infirmary as physician for 21 years. Until 1884, when assistant physicians were appointed, he worked not only in the wards but in the out-patient rooms. He was keenly interested in the welfare of the school of medicine and took a large share in the teaching of the students. Dr. Wardrop Griffith, who followed him in both capacities, writes that Eddison's ward-teaching was always stimulating and suggestive if somewhat lacking in didactic qualities. Thus the men who got most benefit from being associated with him were the senior students, and especially those who had the pleasure of working under him as resident officers. "From some four years' intimate relationship with him I can testify that he was one of the pleasantest men with whom to work; he always gave one credit for doing one's best, and in this way he really did get the best out of his subordinates, who will always bear him in affectionate remembrance."

Eddison's intimate association with medical education in Leeds cannot be properly understood without some reference to the various stages in the development of the University. Although some lectures on medical and surgical subjects had been given in connexion with the infirmary (which was founded in 1767), the Leeds School of Medicine was founded in the year 1831 by the first William Hey, a pupil of John Hunter's, and the most outstanding personality in the history of the school. When the Yorkshire College of Science, which was founded in the very early seventies, enlarged its scope of work by inaugurating chairs in the humanities, an arrangement was made with the new college for medical students to get their pre-medical instruction there. In 1884 a more complete amalgamation between the two bodies took place and the way was paved for the Yorkshire College (which had now dropped its limiting title of "of Science") to affiliate with the Victoria University as one of its three constituent colleges. Dr. Eddison was appointed the first professor of medicine under the new régime. When in 1924 the University of Leeds (now becoming autonomous) celebrated its coming-of-age, Dr. Eddison was awarded the honorary degree of Doctor of Science.

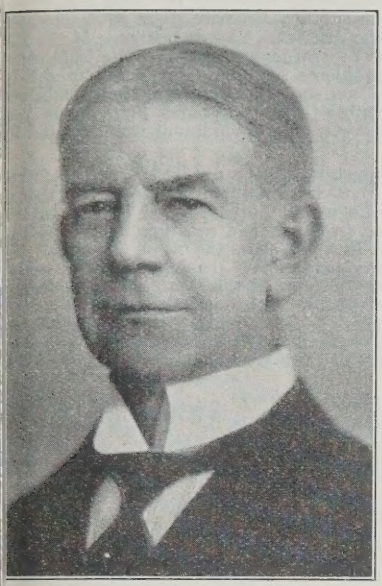
Outside his purely professional life Dr. Eddison was a man of varied culture. He was curator and four times president of the Leeds Literary and Philosophical Society, and on the Council of the Yorkshire Archæological Society. He was a great reader and had a most retentive memory; he was a man of great natural ability; his mind was nimble, alert, and keenly critical. In the opinion of many it was this very hypercritical frame of mind—which in justice it must be said he applied to his own observations and views as well as to those of others—that stood in the way of his contributing as much to the advance of medical science as his great abilities would have seemed to warrant. Eddison was one of the founders of the Leeds Trained Nurses' Institution. He was a magistrate for the West Riding and from 1908 to 1913 hon. colonel of the West Riding Division R.A.M.C. (T.).

Dr. Eddison married Elizabeth, eldest daughter of Mr. John Dougill, of Huddersfield, who survives him without issue. His body was taken back for burial to Adel Churchyard, where there was a large gathering of his old friends and colleagues, with representatives from the University of Leeds and the various bodies on which he served.

CHARLES HUBERT ROBERTS, O.B.E., M.D., F.R.C.P. LOND., F.R.C.S. ENG.

WE regret to record the death of Dr. C. Hubert Roberts who was well known in London as an obstetrician and gynæcologist. Roberts had suffered from failing health for the past year or two and had been advised to take long sea voyages. It was on one of these trips that he had to be landed in Denmark owing to an acute attack of influenza contracted in London some few days previously. He died on Jan. 29th in the sixty-fourth year of his age.

After leaving school at Bedford, Roberts entered the Medical College of St. Bartholomew's Hospital, where he had a distinguished career. Amongst his many successes he carried off the Junior and Senior Scholarships in Clinical Medicine and also the Brackenbury Scholarship in Surgery. Qualifying in 1889, he took the Fellowship of the Royal College of Surgeons in 1892 and won the Gold Medal in the London M.D. in 1896. For some years after qualification Roberts continued to work at his alma mater first in three successive resident posts, later as casualty physician, assistant demonstrator of anatomy in the school, and tutor in midwifery and diseases of women. In the latter capacity he proved to be a most successful examination coach, and when he resigned his appointment he held the record for distinctions gained by his pupils. On leaving St. Bartholomew's Dr. Roberts was appointed to the staff of Queen Charlotte's Hospital and the Samaritan Free Hospital, to which institutions he devoted the best part of his life, retiring only on attaining the age-limit four years ago. He was an active member of the Obstetrical Society and afterwards did his full share of sectional work at the Royal Society of Medicine, where he filled the offices of librarian, junior and senior secretary, and finally was made one of the vice-presidents of the Section of Obstetrics and Gynæcology. In 1910 Dr. Roberts was elected a Fellow of the Royal College of Physicians, and in due course he became an examiner on the Conjoint Board and also in the University of Sheffield and on the Central Midwives Board. He was not a voluminous writer on clinical subjects, but he wrote a useful book on gynæcological pathology and translated Orthmann's small text-book on the same subject. His illustrations in his own text-book and those he executed for some of his colleagues are of high artistic merit; indeed, at one time he had serious intentions of devoting himself entirely to art.



DR. C. HUBERT ROBERTS.

Roberts was a man of modest disposition, and this may, in some measure, have circumscribed his circle of acquaintances; but those who knew him in his work recognised him as an able diagnostician and a highly skilled obstetrician. He had a genial temperament and before his health failed used to delight in entertaining his friends at his club, and in his leisure hours enjoyed exploring the Thames valley in his motor-car, using his house at Taplow as a base.

A COVENTRY CONVALESCENT HOSPITAL.—Lady Haig last week opened, and the Bishop of Coventry dedicated, the Alcock Convalescent Hospital at Keresley Hall on the outskirts of Coventry as an adjunct to the Coventry and Warwickshire Hospital. The cost of the purchase and equipment were provided by a legacy of £11,000 left by the late Mr. John Alcock. There are 40 beds, and patients will be removed to Keresley as early as possible so that the long waiting-list of the main hospital may be shortened.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT BILL.

ON Wednesday, Jan. 30th, the House of Commons went into Committee on the Local Government Bill. Captain BOURNE, Temporary Deputy Chairman of Committees, was in the chair.

Power to Remove Difficulties.

Clause 111 provides that—

"if difficulty arises in connexion with the application of the Act to any exceptional area, or in bringing into operation any of the provisions of the Act, the Minister may by order remove the difficulty or make any appointment, or do any other thing, which appeared to him necessary or expedient for bringing the said provisions into operation, and any such order may modify the provisions of this Act as far as may appear to the Minister necessary or expedient for carrying the order into effect."

Mr. G. B. HURST moved an amendment which he said raised an important constitutional issue because the effect of the clause was to delegate the sovereign powers of legislation to a Government Department. It was true that that delegation was for a limited period, but the fact remained that it was another illustration of the modern practice of Parliament of handing over its powers to departmental control. He moved to omit certain words from the clause with the object of restricting the powers proposed to be given.

Sir H. SLESSER, who supported the amendment, said that it reminded him of the Statute of Proclamations of King Henry VIII., which said that anything which was enacted by the King in Council should have the force of law.

Mr. CHAMBERLAIN (Minister of Health) said that the clause to which objection had been taken had behind it a great weight of precedent. This was no new provision. It was to be found in the Local Government Acts of 1888 and 1894; in the National Insurance Act, 1911; in the Unemployment Insurance Act, 1920; in the Widows', Orphans' and Old Age Contributory Pensions Act, and in the Rating and Valuation Act. There must be some such provision to avoid the necessity for bringing in an amending Bill every time any change was necessary. No case had arisen under clauses of this kind where Parliament had had cause to complain of its abuse.

Sir LESLIE SCOTT said he hoped that the Minister of Health before the report stage would consider whether he could not alter the wording of the clause so as to attain its object whilst avoiding the dangers of which many were now conscious.

Sir A. HOPKINSON said that they had had too much of substituting Ministerial Orders or Orders of a Department for Acts of Parliament.

Mr. RYE said that the Law Society regarded this clause with grave apprehension.

After further debate,

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) promised that before the report stage the various suggestions that had been put forward during the debate should be considered with a view to amending the clause to bring it into conformity with what they all desired.

The amendment was thereupon withdrawn.

Sir KINGSLEY WOOD moved a new clause which he explained provided that before the expiration of the second fixed grant period the Minister in consultation with the local authorities should cause investigation to be made into the working of the formula and the scheme of county distribution.

The clause was read a second time and added to the Bill.

Sir KINGSLEY WOOD moved a new clause which he said gave effect to an agreement made with the local authorities in the following terms:—

It is hereby declared that it is the intention of this Act that in the event of substantial additional expenditure being imposed on any class of local authorities by reason of the institution of a new public health or other service after the commencement of this Act provision should be made for increased contributions out of moneys provided by Parliament.

The clause was carried by 188 votes to 96.

Sir KINGSLEY WOOD moved a new clause dealing with contributions to voluntary associations and introduced to meet the criticism that a voluntary association covering the whole of the country would be obliged to collect small sums from a large number of counties and county boroughs.

The new clause, he said, empowered the Minister, if application was made to him by the counties and county boroughs concerned, to make one payment on behalf of the councils to the association concerned in regard to services relating to maternity and child welfare, lunacy, mental deficiency, and the welfare of the blind, out of the sums payable as the general Exchequer grant.

Dr. VERNON DAVIES asked whether it would be necessary for the county to make application to the Minister every year or whether they could do so for a fixed period or until notice of cancellation?

Sir KINGSLEY WOOD said that he would consider what was the best arrangement. When the Act came into force it was the intention of the Minister of Health to address general communications to the local authorities concerning it, and in one of those communications attention would be directed to this clause.

The clause was read a second time and added to the Bill.

Sir KINGSLEY WOOD moved the following new clause dealing with special provisions as to the functions of poor-law authorities in respect of infant life protection and vaccination:—

As from the appointed day the following provisions shall have effect with respect to functions relating to infant life protection and vaccination formerly discharged by Poor-law authorities:—(*a*) Functions under Part I of the Children Act, 1908, shall, elsewhere than in the county of London, be discharged by the councils of counties and county boroughs as functions under the Maternity and Child Welfare Act, 1918, except that where the council of a district have established a maternity and child welfare committee the said functions shall, in that district, be discharged by the council of the district and not by the county council; and (*b*) Functions relating to vaccination shall be discharged by the councils of counties and county boroughs as functions relating to public health.

He said that this new clause was to make special provision for the functions of poor-law authorities in regard to infant life protection and vaccination. It was necessary to ensure that the functions in regard to those subjects were imposed upon the appropriate authorities and exercised by their appropriate committees. These functions were at present discharged by boards of guardians under Part I. of the Children Act, 1908, and the Vaccination Act respectively. In the absence of any special provisions they might be transferred to county and county borough councils on the appointed day. Therefore it was proposed that the exercise of these functions in all cases should be undertaken by the maternity and child welfare authorities. It was thought that it would be more satisfactory to give the work to those authorities who employed health visitors, the bulk of whose work related to children under 5 years of age. As regarded London, it was not necessary to make any special provision, since the London County Council and the City Corporation were already authorities under Part I. of the Children Act, 1908. In clause 52 of the Bill it would be found that there was power given to the London County Council to transfer their functions to the metropolitan borough councils subject to the making of the necessary application to the Minister. As regarded vaccination, the duties of boards of guardians under the Vaccination Act were in the nature of public health functions and had nothing whatever to do with the relief of the poor. The effect of paragraph (*b*) of the new clause would be to secure that the functions relating to vaccination should be discharged by the county and county borough councils as public health functions, and all matters relating thereto were referred to their health committees instead of to the public assistance committee. Special provision for vaccination work in London was contained in clause 15 (*f*) which provided that this work should be transferred from the boards of guardians to the common council of the City of London and to the councils of the metropolitan boroughs instead of to the London County Council. This provision was in accordance with the wishes of the county council and the borough councils.

The clause was read a second time and added to the Bill.

The committee stage of the Local Government Bill was concluded in the House of Commons on Friday, Feb. 1st, which was the thirteenth and last allotted day allowed under the terms of the Guillotine Resolution.

LOCAL GOVERNMENT (SCOTLAND) BILL.

ON Monday, Feb. 4th, consideration of the Local Government (Scotland) Bill was begun in Committee.

Transfer of Functions.

On clause 1, which provides for the transfer of functions of parish councils and district boards of control to county councils and town councils of large burghs, Sir A. SINCLAIR moved the deletion of the provision relating to the parish councils. Sir J. GILMOUR said that the new central authorities to be set up would be the elected representatives of the people, charged with certain duties, but it was clearly indicated that those bodies should submit definite schemes showing in detail how they would carry out their duties. In the case of the poor-law it was obvious that there must be within these schemes such measure of arrangement as would insure that immediate relief was given to the necessitous people within the district. The real essence of the Bill was that there should be a large amount of elasticity in order that the peculiar problems of particular areas might be dealt with. Dr. ELLIOT, replying to a question, explained that it would be possible to treat the sick poor under Act other than the poor-law. The amendment was defeated by 193 votes to 94.

Sir J. GILMOUR, speaking of the duties to be transferred from parish councils to district councils said that a number of amendments which he would move carried out an undertaking which he gave on the second reading. The duties to be transferred were, in the main, the same duties as the parish councils were performing to-day, with certain exceptions. The chief exception was that of the poor-law but in the matter of dealing with outdoor relief the central body might under their scheme delegate some part of the work to the district councils. The amendments, moved by Sir J. Gilmour, were afterwards carried, and the clause added to the Bill.

On clause 2, which deals with the transfer of certain other functions to the county councils, Dr. SHIELS moved the omission of para. (*b*), which transfers the functions of town councils of small burghs within the county as local authorities for the purposes of the statutory provisos set out in Part I of the First Schedule. (Part I. includes the Infectious Diseases (Notification) Act, the Public Health (Scotland) Acts, 1897 to 1907, so far as relates to infectious, epidemic, and endemic diseases, buildings for post-mortem examinations, vaccination and unsound food, and the Notification of Births Acts, the Midwives (Scotland) Act, the Venereal Disease Act, 1917, Section 4 of the Maternity and Child Welfare Act, 1918, the Public Health (Scotland) Amendment Act, 1925, Midwives and Maternity Homes (Scotland) Act, 1927, and the Food and Drugs (Adulteration) Act, 1928.

Dr. SHIELS said that the proposal did not seem to have any justification and had no relation to the de-ratin proposals. The small burghs had for hundreds of years been places of efficient government. Sir J. GILMOUR replied that it was not the case that the county councils were inefficient. The small burghs would under the Government's scheme play a very large and important part in the policy and administration with which the new larger authorities would be entrusted. The amendment was rejected, and the clause added to the Bill.

On Tuesday, Feb. 5th, consideration of the Scottish Bill was resumed in Committee. On Clause 3, Sir R. HAMILTON moved to omit the subsection providing for the transfer of the functions of the education authorities.

Reply to the Debate.

Dr. ELLIOT, replying to the debate, said that at this moment a recasting of local government was taking place in Scotland, and they expected an extension and enlargement of the powers of the central bodies—the county councils and the town councils—to take place which would raise them to a position of prestige and dignity which they have never enjoyed before. Their hands were being freed by new grant to a very large extent from many of the niggling controls which it was necessary to place on them when the system of the percentage grant was introduced. Furthermore, in the health clauses, the Government were making it possible to alter the health system of Scotland along the line which the health reformers had been demanding now for many years past. When all these great changes were taking place it would be folly and criminal to leave out of account the 8,000,000 school-children who were the very flower of Scotland. The time had gone past when it was possible to treat the mind of the child apart from the body of the child. They must have the close and intimate connexion of the great new authority which was responsible not *ad hoc* for health but *ad omnia*, as health was one of the major functions; if health was not too important a subject to put into the hands of this great new authority, the education was not too important either. If they could entrust this new authority with the terrible and powerful responsibility of tender years of child life of Scotland from 1 to 5, and with the life of the adults of Scotland from school age to death and the bodies of Scotsmen and Scotswomen, it would be going back on all that they were bringing forward and on the whole period of health as one of the most important of modern function to say that the body was the secondary thing and that an *ad omnia* authority can take charge of the bodies of the people of Scotland, but that in respect of this question of

book learning there was something so sacred that it had not to be removed entirely from the ambit of that authority and to be put under different control. The Government's theory and conviction was that the body was as sacred as the mind, and if they could make a strong, fit, and burly generation of young Scots then they would have done something to which the making of the mind of the Scotsman and Scotswoman was not a secondary thing. That is their contention, and it was the contention of the great medical school—call it if they would a materialistic ideal, but the Government did not regard it as such.

The amendment was defeated and the clause agreed to.

Clauses 4, 5, and 6 were agreed to under the guillotine; also Clause 7, which provides for the transfer of officers and superannuation funds.

CORONERS ACTS AMENDMENT BILL.

On Wednesday, Jan. 30th, Mr. MORRIS asked for leave to bring in a Bill to amend the Coroners Acts, 1887 to 1926. He said that as the law stood, where a coroner's court had assembled and a person had been arrested and brought before a magistrate the coroner must, unless he had good reason to the contrary, adjourn the inquest. If the person was charged on an indictment and acquitted on the re-assembling of the coroner's court the jury could not find a verdict against that person, but if the charge was dismissed by the magistrate the jury could find a verdict against the person who had been discharged by the magistrate. A case had arisen at Oxford Assizes in the previous week where such a person after being acquitted by the magistrates was not only again placed in the dock, but had to bear all the expenses of his defence, in addition to which the country had to bear the expense of the attendance of numerous witnesses who were involved in the case. Such a position was illogical and the object of the present Bill was to amend the law accordingly.

The Bill was brought in and read a first time.

DISTRESSED AREAS.

On Feb. 4th Lord EUSTACE PERCY informed Mr. LANSBURY that in Northumberland and Durham £6000 had been placed at the disposal of the medical officers of health of the two countries for supplementary nourishment of mothers.

HOUSE OF COMMONS.

WEDNESDAY, JAN. 30TH.

Disablement in the Navy.

Mr. ROBINSON asked the First Lord of the Admiralty the number of ratings, and the percentage to the total strength, invalided out of the Navy in each of the years ending December 1922, 1923, 1924, 1925, 1926, 1927, and 1928, and the number in each year that were granted disability pensions.—Lieut.-Colonel HEADLAM gave the following figures:—

Year.	Number Invalided.	Percentage to total strength.	Number awarded disability pensions.
1922 ..	2,028	2	379
1923 ..	1,474	1·6	322
1924 ..	1,330	1·5	543
1925 ..	1,517	1·7	522
1926 ..	1,726	1·9	561
1927 ..	1,342	1·5	442
1928 ..	1,242	1·3	402

Spectacles for School-children.

Mr. DAY asked the President of the Board of Education how many children had been fitted and supplied with spectacles in England by the education authorities during the previous 12 months, and whether any, and, if so, how many of these authorities had the advantage of an experienced oculist.—Lord E. PERCY replied: The number of children provided with spectacles in England, under arrangements made by the education authorities during 1927 (the latest period for which returns are available), was 120,413. Out of 288 authorities in England 286 have the services of an experienced oculist.

Dangerous Drugs Traffic at Hong-Kong.

Mr. CECIL WILSON asked the Secretary of State for the Colonies why the import of raw opium from India into Hong-Kong rose from 11,998 kilogrammes in 1926 to 17,089 kilogrammes in 1927; and what the consumption of Government opium amounted to for each of the last five years per head of the Chinese population of Hong-Kong.—Mr. AMERY replied: The opium imported into Hong-Kong from India in 1927 was the authorised amount under the system of restricted exports introduced by the Government of India as from that year. It was based on the average imports of the previous five years, and happened to be greater than that for 1926 because in that year imports were considerably below the average. The consumption of Government opium in Hong-Kong per head of the estimated Chinese population, for the last five years for which figures are available, was: 1923, 0·51 oz.; 1924, 0·47 oz.; 1925, 0·31 oz.; 1926, 0·26 oz.; and 1927, 0·39 oz.

Mr. CECIL WILSON asked the Home Secretary whether his attention had been called to the document O.C. 877, presented a few days ago to the Opium Advisory Committee of the League of Nations, now sitting in Geneva; how the 734 kg. of heroin seized in Hong-Kong in 1924 and brought to Great Britain for disposal were disposed of, and what quantities of this drug had when seized been disposed of during the last five years.—Sir W. JOYNSON-HICKS replied: Yes, Sir. The heroin referred to was sold in this country in 1924 to persons duly authorised under the Dangerous Drugs Acts and Regulations to possess heroin. The total quantity of heroin seized and brought to this country for disposal from 1924 to date was 38,549 ounces. It was all disposed of to persons licensed under the Acts.

THURSDAY, JAN. 31ST.

Supplies of Radium.

Mr. ROBERT MORRISON asked the Minister of Health the quantity of radium at present in this country which was not being used, and who were the owners.—Mr. CHAMBERLAIN replied: I have no means of obtaining full information on this subject. Certain supplies of radium are in the hands of voluntary institutions and private persons. The uses of radium are not restricted to therapeutic purposes, and it rests with those to whom the supplies belong to secure their economical full usage.

Mr. MORRISON: In view of the difficulties which are being caused by local authorities and hospitals endeavouring to purchase radium, will the right hon. gentleman consider the advisability of taking action in order that these bodies may not compete against each other for the radium?

Mr. CHAMBERLAIN: I have told the hon. Member that this matter is under consideration by a special committee whose report I am expecting to receive very shortly.

Assessments of Voluntary Hospitals.

Sir ARTHUR HOLBROOK asked the Minister of Health if he had received complaints as to the large increases recently made in the assessments of voluntary hospitals; and whether, having regard to the benefits conferred on the community by these institutions and the financial difficulties under which many of them were suffering, he would consider the exemption of all voluntary hospitals from local rates.—Mr. CHAMBERLAIN replied: I have received some representations on this subject. The exemption of hospitals from rating could not be effected without legislation, and in my opinion any such proposal cannot be considered apart from the similar claims made on behalf of other charitable and public institutions.

MONDAY, FEB. 4TH.

Nursery Schools.

Mr. HARRIS asked the President of the Board of Education what progress had been made in the organisation of the nursery schools during the last 12 months; and if any new ones had been started during that period.—Lord EUSTACE PERCY replied: One new nursery school has been opened during the last 12 months; two schools are in course of erection. I have approved in principle the provision by the county council of two new schools in London. and I have also received an application for the recognition of a school in London under voluntary management. Four proposals by local authorities, and one by a voluntary body of managers, in the provinces are also under consideration.

Asbestosis.

Mr. W. THORNE asked the Home Secretary if his attention had been called to the prevalence of asbestos of the lungs among young girls employed in asbestos works and which had been diagnosed as asbestosis; if he was aware that cases had been admitted to St Thomas's and the London Chest Hospitals with this complaint; whether he had any record of the number of these cases; and whether he intended to schedule this disease under the Workmen's Compensation Acts.—Sir W. JOYNSON-HICKS replied: The Senior Medical Inspector of Factories reports that while he

is aware of cases of so-called asbestosis of the lungs among women, the effects of asbestos dust are already the subject of a comprehensive inquiry by the medical inspectors, which is being pushed forward as rapidly as possible. As soon as the results of this inquiry are available the question of applying the Workmen's Compensation Act will be considered.

Artificial Silk Industry.

Mr. KELLY asked the Home Secretary what decision he had arrived at in the matter of placing under the Workmen's Compensation Act certain operations in the artificial silk industry as coming under the industrial diseases section.—Sir W. JOYNSON-HICKS replied: I would refer the hon. Member to my reply on May 17th last and to my correspondence with him in September, when I explained the whole position very fully. No fresh facts have since been brought to my notice which would lead me to modify the views then expressed. The only two specific ailments which have so far been brought to my notice in connexion with the artificial silk industry are conjunctivitis of the eyes and sores on the hands, which are sometimes caused by the acid. As regards the conjunctivitis there do not appear to be any sufficient grounds for scheduling this disease. Compensation is not payable under the Act unless the worker is disabled for at least three days, and I am advised that even the severer cases of this affection do not as a rule disable the workman for more than one or two days and that where in exceptional cases it has caused more prolonged disablement it has been due to actual splashes of the acid into the eye, which would constitute an accident within the meaning of the Act. The sores on the hands would appear to be covered by the diseases already scheduled under the Act as dermatitis or ulceration of the skin produced by dust or liquids, but these sores, if treated promptly, should not incapacitate the workman.

A Child's Tonsils.

Mr. VIANT asked the President of the Board of Education whether he was aware that the education authority of Wolverhampton recently initiated a prosecution against Ernest Henry Gwinnett for cruelty to his daughter Gertrude Lily, aged 6, by failing to provide adequate medical aid in the matter of enlarged tonsils; that the only evidence tendered for the prosecution was that of three school medical officers and a schoolmistress; that the senior medical officer stated that the only remedy possible was a surgical operation; that a conviction was recorded; that, on an adjournment, as a result of the intervention of a local branch of the Distributist League, Mr. Gwinnett was represented, and two qualified London physicians in person, two more by affidavit, and one by certificate testified that the child was not suffering and that alternative treatment was practicable; and that this case was concluded on payment of a nominal fine of £2 without costs on an undertaking being given that treatment should continue; whether any expense had been incurred by the education authority.—Lord EUSTACE PERCY replied: I have seen a press report of the case referred to. I understand that it was stated on behalf of the local education authority that it was not their intention to force an operation on Mr. Gwinnett's child, and that all they required was that some treatment should be applied which would be as effective as an operation in curing the child. I have no information as to the expenditure, if any, incurred by the local education authority in connexion with the proceedings.

TUESDAY, FEB. 5TH.

National Health Insurance Control.

Mr. SHINWELL asked the Chancellor of the Exchequer whether he was considering an arrangement with any assurance companies for handing over control of the National Health scheme; and whether he would put the House in possession of all the facts.—Mr. CHURCHILL: I have seen this suggestion in a weekly journal. I gave a denial to it in answering a supplementary question put on Jan. 31st by the hon. gentleman the Member for Miles Platting. I am glad to have this opportunity of repeating the denial. The story is quite untrue. No such project has ever been brought before me or considered by me or by any of my advisers.

Influenza in Glasgow.

Mr. BUCHANAN asked the Secretary of State for Scotland if he was aware of the present epidemic of influenza in Glasgow and the increase of the death-rate arising from it; if his department had made special investigation into the cause; and, if so, what was the result.—Sir J. GILMOUR replied: As regards the first part of the question, I am aware that there is at present an epidemic of influenza in Glasgow, and a regrettably high general death-rate. There is an exceptionally high incidence of acute pneumonia, both primary and influenzal. As regards the second part, the Department of Health are in continuous touch with the Public Health Department of Glasgow, and are aware of the extent and efficiency of the measures taken in coöperation with the poor-law and voluntary hospitals to provide hospital treatment and nursing and medical care in the home. Notwithstanding the notification of nearly 1200 new cases of pneumonia in the week ended Jan. 31st, the waiting list has been cleared and the epidemic, it is believed, has passed the peak. As regards the last part, research into the causation of influenza, into its spread in epidemic form, into its pathology and into its remedy is being continuously pursued by workers in this and in other countries, and in this connexion the present outbreak is being watched and studied. I am of opinion that it is from research of this kind that the most useful results are to be expected.

Silicosis in the Sandstone Industry.

Mr. RENNIE SMITH asked the Home Secretary if he could furnish particulars of the proposed special scheme under Section 47 of the Workmen's Compensation Act, 1925, providing for compensation for silicosis for workmen in the sandstone industry; and if he could indicate the chief areas of the country, with the number of workmen involved.—Sir W. JOYNSON-HICKS replied: I am sending the hon. Member a copy of the draft scheme together with a copy of an explanatory letter issued to employers affected. I am also enclosing a copy of a report which has been published by H.M. Stationery Office, of a medical inquiry recently carried out for the Home Office and Mines Department into the occurrence of silicosis in the sandstone industry. The chief areas concerned are West Riding of Yorkshire Lancashire, North Derbyshire, and Durham and Northumberland. It is impossible to give accurate figures as to the number of workmen affected, but it is estimated roughly that the number will be not less than 11,000.

Mr. KELLY asked the Home Secretary if he would state the number of cases of disablement from silicosis which were reported during 1928; how many were partially disabled; the number permanently disabled; and the number of deaths from this disease.—Sir W. JOYNSON-HICKS said: This disease is not notifiable and I regret that the only figures I can give are those of cases dealt with under the Refractories Industries scheme. The new cases arising under that scheme in 1928 included 27 cases of partial and five cases of total disablement; and four deaths. In addition, there were three deaths of workmen who had previously been in receipt of compensation.

MEDICAL BATHS, TORQUAY.—A new vita-glass sun lounge at the Medical Baths, Beacon Hill, Torquay, will be opened by Sir Henry Gauvain on Feb. 20th, at 3.30 P.M.

ELLA SACHS PLOTZ FOUNDATION FOR THE ADVANCEMENT OF SCIENTIFIC INVESTIGATION.—The fifth annual report of this Foundation has just been issued. During the year 43 applications for grants were received by the Trustees, 29 of which came from other countries and 14 from the United States. The total number of grants made was 21. In the five years of its existence the Foundation has made 73 grants and investigators have been aided in the United States, Great Britain, France, Germany, Austria, Hungary, Switzerland, Italy, Sweden, Esthonia, Czecho-Slovakia, Poland, Chile, and Syria. A list of investigators and of the researches which have been aided in the current year is given. In accordance with the statement made by the trustees regarding the purposes for which the Fund would be used those researches are favoured that are directed towards the solution of problems in medicine and surgery or in branches of science bearing on medicine and surgery. As a rule preference is given to researches on a single problem or on closely allied problems. Grants may be used for the purchase of apparatus and supplies that are needed for special investigations, and for the payment of unusual expenses incident to such investigations, including technical assistance, but not for providing apparatus or materials which are ordinarily a part of laboratory equipment. Stipends for the support of investigators will be granted only under exceptional circumstances. In 1928 the largest grant given was $1000 (to each of three workers) and the smallest given was $250. No grants to British workers appear to have been made during the year. Applications for grants to be held during the year 1929–30 should be in the hands of the Executive Committee before May 15th, 1929. Applications should include statements as to the character of the proposed research, the amount of money requested, and the objects for which the money is to be expended, and should be addressed to Dr. Joseph C. Aub, Huntington Memorial Hospital, 695, Huntington-avenue, Boston, Mass.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent congregations the following degrees have been conferred:—

M.D.—A. D. Porter.
M.B. and B.Chir.—W. J. Lloyd.
B.Chir.—S. D. Isaacs and W. E. Underwood.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the undermentioned subjects:—

Surgery.—J. S. B. Bray, Cambridge and St. Bart.'s Hosp. N. N. Datta, London Hosp.; A. R. Edwards, Liverpool; and C. F. H. Quick, St. Mary's Hosp.
Medicine.—G. E. Bent, Manchester; J. S. B. Bray, Cambridge and St. Bart.'s Hosp.; and A. Weeks, St. Bart.'s Hosp.
Forensic Medicine.—J. S. B. Bray, Cambridge and St. Bart.'s Hosp.; J. Freud, Vienna and St. Bart.'s Hosp.; L. P. Gregory, Bristol; I. Lipschitzi, Liverpool; and A. Weeks, St. Bart.'s Hosp.
Midwifery.—J. Freud, Vienna and St. Bart.'s Hosp.; H. G. Edmunds, Univ. Coll. Hosp.; and D. F. Michael, St. Mary's Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: G. E. Bent, J. S. B. Bray, J. Freud, and A. Weeks.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—At an ordinary quarterly Comitia of the College held on Jan. 31st, the President, Sir John Rose Bradford, being in the chair, the following candidates, having satisfied the Censors' Board, were elected to the Membership of the College:—

Eric Newmarch Allott, Gerald Vincent Francis Doyle, Gareth Aimers Eason, Alfred Henry Gerrard, Jessie Gordon, Lazarus Hartston, Kenneth Hoani Holdgate, Herbert Hylton Hyland, Simon Kelly, Michael Edward Lampard, Samson George Moore, Kenneth Beeson Noad, Walter Gordon Chisholm Paterson, Robert Sturtevant Pilcher, Charles Percy Pinckney, Francis Crosbie Roles, Cyril Dee Shapland, Bryan Buckley Sharp, Clive Henry Sippe, Robert Stanley Steel, Robert W. Glennan Stewart, Warrington Yorke, Janet Dorothea Ernestine Young.

Licences to practise were conferred upon 149 candidates (134 men and 15 women) who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates:—

H. H. Aitchison, Oxford and London; G. G. Allan, Cambridge and Univ. Coll.; Lucy E. Arthur, Royal Free; M. W. Atkinson, Middlesex; S. W. Barber and R. C. Bennett, St. Bart.'s; H. Bernstein, Cape and Univ. Coll.; G. H. Bradshaw, Cambridge and St. Bart.'s; Rochelle Churin, Royal Free; F. Clifton, Cambridge and St. Thomas's; G. C. Cochrane, Liverpool and London; C. E. Corrigan, Manitoba; C. F. Cosin, Guy's; Florence K. Costello, Sydney and Charing Cross; P. J. Cowin and D. F. L. Croft, St. Bart.'s; R. Cutler, Guy's; L. E. Daniel, Madras and St. Thomas's; C. J. M. Dawkins, Cambridge and Middlesex; E. M. Dimock, Cambridge and Univ. Coll.; J. Donovan, Leeds; H. A. Eason, London; A. M. Easton, St. Thomas's; J. A. Eddy, Oxford and Middlesex; M. A. A. El Gammal, Cairo; A. C. Elkin, Univ. Coll.; G. W. Etches, Leeds and London; T. Evans, Bristol; T. C. J. Evans, Birmingham and St. Mary's; A. D. Everett, St. Bart.'s; T. D. Finey, Adelaide and London; W. R. Forrester-Wood, Cambridge and St. Bart.'s; C. H. Forsyth, London; E. Foster, Cardiff and St. Mary's; R. H. Francis, Cambridge and St. Bart.'s; S. L. Gargye, Indore and Manchester; W. S. Ghai, Punjab and Charing Cross; J. M. Gibson, Oxford and St. Thomas's; P. J. E. Godard, Lausanne and Paris; M. W. Gonin, I. Gordon, and J. T. C. Gray, St. Bart.'s; D. R. Griffith, St. Thomas's; C. C. Griffiths, Liverpool; A. J. Groenewald, Cape and Guy's; Gwendoline E. Grove, Cambridge and St. Mary's; R. G. Gwynne, Adelaide and London; M. K. Gyi, Guy's; R. W. Haines, Univ. Coll.; A. S. Hall, Cambridge and St. George's; H. S. Hamlin, St. Thomas's; J. M. Harker, London; H. M. Harris, Oxford and London; G. F. Harrison, St. Thomas's; F. F. Hellier, Cambridge and Leeds; R. T. Hicks, Univ. Coll.; Louisa S. Hobbs, Charing Cross; R. C. Holderness, Leeds; F. W. Holdsworth, Cambridge and St. George's; G. J. Hollis, South Africa and Guy's; A. S. Hoseason, St. George's; R. I. Hyder, London; C. G. Jobbins, Cambridge and St. Thomas's; Margaret L. Jones, Univ. Coll.; O. T. Jones, Cardiff and St. Bart.'s; H. W. Jordan, Univ. Coll.; S. E. Knowles, Guy's; L. W. A. Lankester and J. F. V. Lart, Cambridge and St. Thomas's; Cesia Leben, Univ. Coll.; Florence M. Lessing, Univ. Coll. and Charing Cross; A. Levy, St. Thomas's; K. Lindberg, Paris and Middlesex; A. G. Lloyd, Durham; R. M. B. Lowis, St. Thomas's; Dorothy M. Lufkin, Univ. Coll.; R. Machray, Westminster; J. K. Marshall, Oxford and Guy's; A. Mathews, London; S. N. Mathur, Lucknow and London; R. A. Maynard, Cambridge and St. Thomas's; K. G. Milad, St. Mary's; W. B. Millar, Middlesex; M. V. Modi, Bombay and London; G. Morgan, St. Mary's; G. H. Morley, Middlesex; J. E. Myers, Adelaide and London; T. H. Negus, St. Thomas's; D. A. Nicoll, King's Coll.; G. S. Nightingale, London; W. G. Oakley, Cambridge and St. Bart.'s; R. I. O'Farrell, Sheffield; T. L. Owen, Leeds; L. G. M. Page, St. Bart.'s A. J. Parer, Sydney and King's Coll.; A. F. Parker, London; A. R. D. Pattison, Durham; I. Preiskel, St. Bart.'s; R. Purvis, St. Thomas's; S. M. Rahman, Calcutta and Middlesex; A. S. Rajasingham, Ceylon and Middlesex; T. G. Reah, Cambridge and London; Dorothy K. Reynolds, King's Coll.; A. C. Riley, St. Bart.'s; G. L. Robinson, Cambridge and London; V. C. Robinson, Cambridge and St. Bart.'s; T. S. Rodgers, Westminster; E. B. Rogers, Guy's; B. Rothery, Cambridge and St. George's; A. S. D. Russell, St. Thomas's; B. W. Rycroft, St. Andrew's; N. Sachnovics, Berlin and Guy's; H. R. D. Schofield and T. L. Scott, St. Mary's; Mary Scouloudi, Univ. Coll.; D. A. Seaman, Birmingham; J. E. Semple, Cambridge and St. Thomas's; G. M. A. Shaikh, Bombay and London; Mary E. Sharp, Univ. Coll.; J. D. Simpson and A. D. Skyrme, Cambridge and London; C. E. Soodeen, Middlesex; A. Southgate, Charing Cross; B. Stanley, Univ. Coll.; H. Stark, St. Bart.'s; E. T. W. Starkie, Cambridge and St. Mary's; G. A. Stevenson, Birmingham; E. C. Sugden and H. Taylor, Cambridge and St. Bart.'s; I. Taylor, King's Coll.; V. C. Thompson, Cardiff and St. Bart.'s; S. A. Underwood, St. Mary's; Bertha D. Upton-Jones, Royal Free; V. C. Verbi, King's Coll.; Frances J. Vinter, Royal Free; W. E. Wainman, Leeds; C. M. E. Warner, Bengal and King's Coll.; R. P. White and J. S. Whiting, Cambridge and St. Bart.'s; Florence Whitrow, Manchester; A. G. Williams, Cardiff and St. Bart.'s; A. W. Williams, Cambridge and Westminster; J. D. Williams, Cardiff; Beatrice M. Willmott, Cambridge and Birmingham; G. M. Willoughby, Middlesex; W. R. Winterton, Cambridge and Middlesex; F. G. Wood-Smith, Cambridge and St. Bart.'s; R. G. Zaglama, Assiut and Manchester; E. Zimbler, Dorpat and Middlesex.

The undermentioned diplomas were also conferred conjointly with the Royal College of Surgeons, to the following candidates:—

Diploma in Public Health.—G. E. Addison, N. T. Advani, C. L. Ahluwalia, J. S. Allan, A. N. Chopra, Marguerite E. Cliff, W. Conroy, K. St. V. Edwards, E. Egan, J. Egan, V. Feldman, J. Ferguson, M. T. Fernando, Barbara Finch, A. N. Ghei, Winefride M. Gibson, N. G. Hill, Katherine M. Hirst, D. P. Holmes, Amelia M. Ison, C. W. W. Jeremiah, Ellen F. Kelleher, W. H. Kelleher, L. D. Khatri, E. T. Lloyd, W. S. Martin, M. V. Merchant, P. L. Nirula, Mary O'Leary, Helen E. D. E. Ornstein, W. G. Patterson, R. F. Pinson, F. W. G. Smith, R. B. Subramanyam, R. W. C. Thambiah, D. J. Valentine, and E. M. Wright.
Diploma in Psychological Medicine.—R. W. Armstrong, Eileen A. Chennell, A. Craig, H. Hinchco, Phyllis M. Horton, D. L. McCullough, D. Menzies, J. E. Nicole, Muriel L. M. Northcote, Eveleen J. O'Brien, J. C. Ramsay, and C. E. Roachsmith.
Diploma in Laryngology and Otology.—M. I. Ashmawi, A. Blagoff, N. M. Eadie, M. Husnain, N. H. Meacle, H. V. O'Shea, H. M. Petty, S. Roy, E. C. Tamplin, and W. L. Thomas.

Dr. C. H. J. Lockyer was elected to the Council in the place of Sir Hugh K. Anderson (deceased), Dr. Gordon Holmes was elected examiner in psychological medicine, and Dr. W. J. Fenton examiner in medicine.—The award of the Swiney Prize for 1929 to Dr. Sidney Smith was announced.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—The next quarterly meeting of this Association will be held on Feb. 14th at the British Medical Association House, Tavistock-square, London, W.C., under the presidency of Prof. J. Shaw Bolton, when the discussion on General Paralysis, adjourned from the November meeting, will be resumed.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—A conversazione will be held at the Society's house, 17, Bloomsbury-square, London, W.C., on Tuesday, Feb. 12th, from 7.30 P.M. to 10 P.M., when the whole premises will be open to visitors, and exhibits will be shown in the museums and laboratories.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting will be held at the Miller General Hospital, Greenwich, London, S.E., to-day, Feb. 8th, at 8.45 P.M., when Mr. H. P. Winsbury White will read a paper on Chronic Infection of the Urinary Tract, its Causes and Treatment, with illustrations.

MANCHESTER AND DISTRICT RADIUM INSTITUTE.—The executive committee of this Institute have decided, subject to careful safeguards, to let out radium on hire to hospitals and to practitioners. Up to the present this has not been done in Manchester, although it is the custom at the London Radium Institute and the Belgian Institution in Brussels. The conditions of hire have yet to be formulated. The committee have also decided to make a further purchase of radium for this purpose, money having been received from the trustees of the late Mr. John Barlow. Dr. G. E. Birkett, who has been radiologist to the Institute during the past six years, has been appointed honorary consulting radiologist. It has been decided to appoint a second assistant radiologist, so that in future there will be three experts constantly working in the service of the Institute.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE.—This school is appealing for £150,000 in order to free itself from continual financial embarrassment. The appeal embraces a scheme to commemorate Alexander Mackay, of Uganda, by endowing research fellowships in the school. Miss Caton, daughter of the late Prof. Richard Caton, M.D., has given £2000 to be devoted to an object which can be associated with her father's name. This sum is to be earmarked towards the endowment of a Caton Research Fellow in Biochemistry.

THE NEW FREEMASONS' HOSPITAL.—It is estimated that the total cost of providing the new Freemasons' Hospital at Ravenscourt Park, Hammersmith, will be a quarter of a million. The hospital has outgrown its present quarters in the Fulham-road, the number of patients last year, 686, having been the largest on record. Of these, 244 came from the provinces and overseas. The new site, which practically adjoins Ravenscourt Park, is 3½ acres in extent, and there are to be from 120 to 130 beds, a very large increase upon the present number, with capacity for easy extension.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 12th.—8.30 P.M., PSYCHIATRY and NEUROLOGY, Special Discussion on Prognosis and Treatment of General Paralysis of the Insane. Openers: Dr. W. H. B. Stoddart (Psychiatry), Sir James Purves-Stewart (Neurology). Other speakers: Dr. J. Brander, Dr. G. de M. Rudolf, Major F. H. Stewart, I.M.S., Dr. Thomas Tennent, Surgeon Rear-Admiral E. T. Meagher, R.N., Dr. R. M. Stewart, and others. THERAPEUTICS: There will be no Meeting of this Section in February.

WEDNESDAY.—5.30 P.M., SURGERY: SUBSECTION OF PROCTOLOGY. Short Papers: Mr. W. B. Gabriel: Case of Carcinoma of the Rectum Complicated by Enlarged Prostate. Dr. P. H. Manson-Bahr: Pathology of Bilharzia and Amœbic Dysentery of Colon and Rectum. Mr. R. Maingot: Three Cases of Acute Intestinal Obstruction Due to Fæcal Impaction. Mr. A. Lawrence Abel: Three Cases of Multiple Cancers of Rectum and Colon.

THURSDAY.—5 P.M., BALNEOLOGY. (Exhibition of photographs at 4 P.M.) Discussion on Osteo-arthritis. Opening Papers will be read by: Dr. R. G. Gordon (Bath). Dr. J. A. Thomson (Harrogate): Osteo-arthritis Radiographically Considered. Dr. Tom Hare and Dr. Henry Cohen: The Chemical Estimation of Synovial Fluid and Blood Serum of Horses Affected with Chronic Arthritis. 8.30 P.M., PSYCHIATRY and NEUROLOGY. Special Discussion on Prognosis and Treatment of General Paralysis of the Insane, continued from Tuesday.

FRIDAY.—8 P.M., OBSTETRICS. Paper: Prof. J. Heyman (Stockholm): The Uses of Radium in the Treatment of Malignant Diseases of the Uterus and Ovaries. Mr. Victor Bonney and Dr. J. D. Malcolm will also speak. 8 P.M., ELECTRO-THERAPEUTICS. Discussion on Chronic Rheumatism of Joints and Muscles; Diagnosis and Treatment.

ROYAL INSTITUTION, Albemarle-street, W.

THURSDAY, Feb. 14th.—5.15 P.M., Sir William Bragg: The Early History of X rays.

FRIDAY.—9 P.M., Mr. E. K. Rideal, D.Sc.: Chemi-Luminescence.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C. (Arris and Gale Lectures.)

MONDAY, Feb. 11th, WEDNESDAY, and FRIDAY.—5 P.M., Prof. H. A. Harris: Bone Growths in Health and Disease.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 11th, to SATURDAY, Feb. 16th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., at 5 P.M., Lecture, Mr. Andrew Wylie: The Difficulties Experienced in the Diagnosis of Laryngeal Diseases. Thurs., at 4.30 P.M., Lecture, Dr. Gerald Slot: Calcium Therapy.—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. Mon., at 2.30 P.M., Clinical Demonstration, Mr. Aubrey Goodwin (Gynæcology), Out-patient Department.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Tues., at 6 P.M., Demonstration, Dr. J. E. M. Wigley (Dermatology).—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M., Demonstration, Dr. S. H. Daukes: A Consideration of Various Types of Ulceration Met with in the Stomach and Intestines. The above are free.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Special Course in Gynæcology. Some mornings and afternoons.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Special Course. Afternoons and evenings. Lectures twice weekly. Duration four weeks. Further information from the Secretary of the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Feb. 11th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Feb. 15th.—4 P.M., The Significance of Aural Pain

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital 49, Leicester-square, W.C.

THURSDAY, Feb. 14th.—5 P.M., Dr. J. E. M. Wigley: Lupus Erythematosus.

UNIVERSITY COLLEGE, London.

TUESDAY, Feb. 12th.—5.30 P.M., Mr. G. M. Morant, D.Sc.: The Rhodesian Man and his Relation to Other Types of Man.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street W.C.

THURSDAY, Feb. 14th.—4 P.M., Dr. Thursfield: The Prognosis of Nephritis.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Feb. 12th.—2.15 P.M., Dr. B. E. Schlesinger: Infant Feeding. 3.15 P.M., Mr. E. Wolff: Ocular Pain

NATIONAL COUNCIL FOR MENTAL HYGIENE.

WEDNESDAY, Feb. 13th.—5 P.M. (at the Medical Society of London, Chandos-street, W.), Dr. Helen Boyle: Dangerous Ages: Middle Age.

LEEDS POST-GRADUATE COURSE ON CANCER.

WEDNESDAY, Feb. 13th.—3.30 P.M. (in the Leeds Medical School), Dr. A. Leitch: Recent Researches in Cancer

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE Manchester.

FRIDAY, Feb. 15th.—4.30 P.M. (at the Whitworth-street West Branch), Dr. Ward: Cough, in Infancy and Childhood.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS

FRIDAY, Feb. 15th.—3.30 P.M., Mr. Yates: Surgical Cases

Appointments.

FERGUSON, F. R., M.D. Manch., D.P.H., has been appointed Registrar to the National Hospital for Nervous Diseases, Queen-square, W.C.

GARTON, W., M.R.C.S., D.M.R. & E. Camb., Honorary Radiologist to the Kent and Canterbury Hospital.

SEVERN, A. G. M., M.D. Brux., L.R.C.P. Lond., M.R.C.S., D.P.H., Medical Officer of Health for Pontypridd.

TROUP, JAMES, M.B., Ch.B. Manch., F.R.C.S. Edin., Honorary Assistant Surgeon to the Royal Hampshire County Hospital, Winchester.

Certifying Surgeons under the Factory and Workshop Acts ERSKINE, W. A., M.B., Ch.B. Edin. (Parbold, Lancaster) GANE, E. P. S., M.D. Durh. (Llansawel, Carmarthen) and MCCREA, R. A., M.B., B.Ch. (Chesterfield, Derby).

Vacancies.

For further information refer to the advertisement columns.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Bootle Borough Hospital, Derby-road.—Sen. M.O. Also Two Jun. M.O.s. At rate of £150 and £125 respectively.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £120.

Brighton, French Convalescent Home, de Courcel-road, Kemp Town.—Hon. Visiting Physician.

Brighton, Royal Alexandra Hospital for Sick Children.—H.S. At rate of £100.

Cancer Hospital, Fulham-road.—Director of Electrical and Radio-Therapeutic Dept.

Cardiff, City Lodge Institution.—Third Asst. Res. M.O. At rate of £100.

Cardiff, University College of South Wales and Monmouthshire.—Lecturer and Demonstrator in Anatomy. £400.

Carlisle, Cumberland Infirmary.—H.P. Also Two H.S.'s. Each at rate of £155.

Charing Cross Hospital, W.C.—Hon. Clin. Asst. in X Ray Dept.

Chesterfield and North Derbyshire Royal Hospital.—Cas. H.S. At rate of £100.

Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. At rate of £150.

Derby, Royal Derby and Derbyshire Nursing and Sanitary Association.—Hon. Obstetric Physician to the Nightingale Nursing Home.

Dreadnought Hospital, Greenwich.—Phys. to Out-patients.

East Ham Memorial Hospital, Shrewsbury-road, E.—Hon. Asst. Physician.

Glasgow, Hawkhead Asylum, Crookston.—Jun. Asst. M.O. £27

Hospital for Sick Children, Gt. Ormond-street, W.C.—Cas. O. £400. Also Asthma Research Scholar. £300.
Ipswich County Borough.—Asst. M.O.H., &c. £600.
Jersey Mental Hospital.—Med. Supt. £650.
Liverpool, David Lewis Northern Hospital.—H.S. for Orthopædic, &c. At rate of £100.
L.C.C. Mental Hospital Service.—Eighth Asst. M.O. £300.
Lucknow University.—Professorship of Medicine and Physician to King George's Hospital. Rs.1200–50–1400 p.m.
Manchester, Ancoats Hospital.—H.P. At rate of £100. Also H.S. Orthopædic. £100
Manchester and Salford Hospital for Skin Diseases.—H.S. £100.
Manchester Hospital for Consumption, &c.—Hon. Asst. Phys.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Refraction Clerk to the Ophthalmic Dept. £150.
Newport, Mon., County Borough Mental Hospital.—Asst. M.O. £300.
Perth, James Murray's Royal Asylum.—Asst. Physician. £300.
Queen's Hospital for Children, Hackney-road, E.—Anæsthetist. £25. Also Res. M.O. £200.
Rampton State Institution for Mental Defectives, near Retford.—M.O. £536 10s.
Royal Free Hospital, Gray's Inn-road, W.C.—Eastman Dental Clinic Director.
Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.
Ryde, Royal Isle of Wight County Hospital.—Vacancy on Hon. Medical Staff.
St. John's Hospital, Lewisham, S.E.—Hon. position in Psychological Medicine.
St. Paul's Hospital, Endell-street, W.C.—Hon. Cardiologist.
Smethwick County Borough.—Sen. Asst. M.O.H. £550.
Southampton, Royal South Hants and Southampton Hospital.—Sen. H.S. £175, H.P. £130, Jun. H.S. At rate of £130. Also Cas. O. At rate of £120.
Sudan Government.—Medical Officer. £E.852.
Surrey Administrative County of.—County M.O.H. £1800.
Swansea County Borough Infectious Diseases Hospital.—Res. M.O. £350.
Swansea Hospital.—H.S. £150.
Tunbridge Wells and Counties General Hospital.—H.S. £160.
Warwick County Mental Hospital, Hatton.—Jun. Asst. M.O. £350.
Watford, Herts, Peace Memorial Hospital.—Res. M.O. At rate of £150.
West Bromwich and District General Hospital.—H.S., H.P. Also Cas. H.S. Each at rate of £200.
West London Hospital, Hammersmith-road, W.—Hon. Obstetric Registrar.
Willesden General Hospital, Harlesden-road, N.W.—Hon. Ophthalmic Surgeon.
Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.—Hon. Sen. Dental Surg., Hon. Dental Surg. Also Asst. Phys. to the Radiological Dept. £50.
York Dispensary.—Res. M.O. £150.
The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Hollingbourne (Kent).

Births, Marriages, and Deaths.

BIRTHS.

BEWLEY.—On Feb. 2nd, at Courtfield-road, South Kensington, the wife of Dr. Maurice Bewley, of a daughter.
HEFFERNAN.—On Jan. 26th, the wife of Major P. Heffernan, I.M.S. (retired), of a son.
MARSHALL.—On Jan. 30th, at a nursing home, Sheffield, the wife of Dr. G. G. Marshall, of a son.

DEATHS.

CLARK.—On Jan. 26th, George Clark, M.B., C.M., of Stockwell Park-road, S.W.
EDDISON.—On Jan. 27th, at Woodcroft, Cuckfield, Sussex, John Edwin Eddison, M.D., aged 86.
HAYNES.—On Jan. 28th, at Cathcart-road, South Kensington, Dr. James Robert Haynes, in his 86th year.
ILES.—On Jan. 31st, at Vivary Cottage, Taunton, Alfred Robert Iles, M.R.C.S. Eng., L.R.C.P. Lond., in his 77th year.
OGSTON.—On Feb. 1st, at Union-street, Aberdeen, Sir Alexander Ogston, K.C.V.O., M.D., LL.D.
OWEN.—On Jan. 31st, at 13, Rodney-street, Liverpool, of acute pneumonia, John Owen, M.D., F.R.C.P., aged 58, hon. physician, Liverpool Royal Infirmary.
SCORESBY-JACKSON.—On Jan. 30th, at 31, Thornsett-road, Anerley, S.E.20, Thomas Scoresby-Jackson, M.D., aged 79 years. Internment Monday, February 4th, in Elmers End Cemetery.
SHARP.—On Jan. 26th, at Charnwood House, Derby, John A. Sharp, M.R.C.S., L.R.C.P., consulting surgeon to the Derbyshire Royal Infirmary, in his 82nd year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. II., 1928.

THE Index and Title-page to Vol. II., 1928, which was completed with the issue of Dec. 29th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

NIGHT VISION OF AVIATORS.

How much can a man see in the darkness of the night, and how long does it take him to become fully accommodated to the darkness? An answer to these questions is given by Surg. Lieut.-Col. P. J. E. Beyne and Surg.-Commander G. Worms, from the French Medico-Physiological Laboratory of Military Aviation, in the *Archives de Médecine Militaire* for last September (p. 231). They measured the vision of three aviators on a clear dark night in September, decided later, in a dark chamber, on the artificial illumination required to give the same vision—this they state as 0·0015 lux—and after many experiments declare the acuity of night vision to be 6/100 to 9/100 of what is considered normal by day. They found, too, that it lessens with age over 30, and that it does not reach its maximum until after 20–35 minutes in darkness. These figures are for Europeans; two natives of Tonkin both reached 10/100 in 25 minutes, an acuity greater than in any European examined. Night vision is, the investigators say, so important to aviators employed as night fliers or night bombers that they must be specially selected, attention being given both to the keenness of their night vision and the rapidity of its attainment. They further recommend that in night-flying areoplanes the dials on the dashboard shall only be illuminated with red-purple lamps, the less to disturb the pilot's vision as he flies.

A MEDICAL RECLUSE.

A VERDICT of "death from natural causes" was returned at an inquest in Leeds on Feb. 1st on A. Clarence Foster, M.R.C.S., of Leeds, aged 84, son of a well-known Leeds doctor. He lived for many years with his elder brother Philip, an M.D. of St. Andrews, who died in August, 1927, and who left over £40,000. The two brothers occupied a house for over 70 years in Park-place, now the centre of a business area. Dr. Clarence Foster had not practised for many years and occupied the back rooms in the house, living the life of a recluse in a most frugal way, wearing tattered clothes and broken shoes. He was attended only by an old woman who occasionally went to clean his rooms, and who on getting no response to her call, informed the police. The doctor was found lying in a passage. He was taken to the infirmary and died a few hours later. He qualified M.R.C.S. Eng. in 1868 and was the author of "A Brief Historical Account of the Hôtel-Dieu, Paris, 1875," "Memorial Sonnets of Italy," and "Biographical Sketch of William Dunbar, Laureate to James IV.," 1891. Philip Foster published in THE LANCET, 1872, an account of a case of Cæsarean operation with recovery.

A BED-MAKING DEVICE FOR BEDRID PATIENTS.

THE difficulties of making the beds of helpless patients are not to be minimised. In a large hospital, with excellent equipment and a highly skilled nursing staff, these difficulties are not very apparent, but bed-making by attendants of only moderate skill may be a daily trial attended by much unnecessary discomfort and suffering. A device, known by the rather cumbersome title, "A Combined Bed Re-making and Transport Stretcher," has been invented and described by Dr. S. Orell (Acta Chir. Scand., 1928, lxiv., 24), and he suggests that it should be put into routine hospital use for bedridden patients. This may be unnecessary, but where skilled attention is not available the device might well be adopted. A frame, shaped so that it can be pushed over the bed, is surmounted by a stretcher which rotates in a longitudinal axis. The patient is rolled upon his side by a nurse, the frame is pushed over the bed, and the stretcher is rotated until it lies along his back. The patient is allowed to fall back on the stretcher, which is then rotated to the horizontal position, and the whole frame is wheeled away while the bed is re-made. The patient is deposited in bed again by reversing the process. There is no lifting, but only rolling or turning, and this makes the apparatus of great value for moving very heavy patients.

NEW PREPARATIONS.

We have received from Messrs. Cranbux, Ltd., of Westwick-street, Norwich, an assortment of flasks of *Odol* and tubes of *Odol paste*, for which the manufacturers claim merits as an antiseptic oral preparation. The preparation is so popular that no words are necessary to describe its properties as a pleasant cleanser and deodoriser in which certain antiseptic powers can be identified.

Syrup Pertussis (*Gabail*) is a product for which the Anglo-French Drug Company, Ltd., 238A, Gray's Inn-road, London, W.C., are the agents, and the claim is made that it is particularly effective in treating the paroxysms of whooping-cough. The formula is ext. valerian deodorised 2·4 g., amm. valerianate 2·4 g., strontium bromide 2·0 g., chloral hydrate 3·0 g., ext. droseræ liq. 2·0 g., syr. rubus idœus 60 c.cm., aq. destillata ad 125 c.cm., and the dosage is as follows: From 6 months to 1 year, two teaspoonfuls of the syrup mixed with a tablespoonful of sweetened water, a teaspoonful of which mixture is given every three hours; from 2 to 4 years, two teaspoonfuls of plain syrup in the morning, one at midday and one in the evening with meals; and from 4 to 12 years, one tablespoonful in the morning, midday, and evening, and an additional tablespoonful two hours after going to bed. The preparation is only a remedy for, or alleviation of, the coughing fits and vomiting, as is indicated by the presence in it of sundew and valerian, while strontium has a reputation for value in vomiting of nervous origin. The manufacturers do not claim that it is in any sense a cure for whooping-cough.

Benzyl Cinnamic Ester (*Dr. Jacobson's Solution*).—In THE LANCET of May 5th, 1928, is a note on the use of Benzyl Cinnamic Ester in Tuberculosis by Dr. H. Gainsborough, who describes the use by Dr. J. Jacobson of balsam of Peru as a remedy for certain forms of tuberculosis, especially of the skin. Jacobson, in 1919, suggested an analogy between tuberculosis and the disease due to pathogenic fungi, and the employment of the balsam is justified on account of its antiparasitic properties. French experience, according to Gainsborough, has given encouraging results in the treatment of pulmonary tuberculosis by benzyl cinnamic ester, but his observations were made mainly upon cases of external manifestations, although, in addition to reporting encouraging results in various cases of discharging sinus and lupus, he describes the relief also of typical cases of pulmonary, laryngeal, and renal tuberculosis with cystitis. The results which Jacobson obtained in treatment of tuberculosis of the skin at the Hôpital St. Louis have been confirmed by J. Darier, E. Jeanselme, M. Mitchitch, and other observers. The manufacturers and agents in Great Britain of Dr. Jacobson's solution are Messrs. Boots Pure Drug Company, Nottingham. The solution is supplied in 1 c.cm. vials, with the following description of Jacobson's method of administration in external and general tuberculosis:—

"(*a*) Cases of external tuberculosis unaccompanied by pulmonary or bucco-laryngeal tuberculosis are given an injection of 1 c.cm. of the solution.

"(*b*) Cases of external tuberculosis complicated by pulmonary or bucco-laryngeal tuberculosis are given the same doses as are recommended in the treatment of pulmonary tuberculosis.

"(*c*) In pulmonary and bucco-laryngeal tuberculosis the dose is 0·25 c.cm. of the solution. If, however, the general condition of the patient is good, 0·5 c.cm. can be administered. For children between eight and twelve years of age, half the adult dose is given."

The treatment of varicose veins by the injection of sclerosing solutions should be facilitated by the use of "*Hypoloid*" *Quinine and Urethane*, which has recently been issued by Messrs. Burroughs, Wellcome and Co. This solution consists of quinine hydrochloride 0·26 g. and urethane 0·13 g. in 2 c.cm. of sterile distilled water, issued in hermetically sealed glass containers ready for immediate use. Special literature on the successful use of this solution is supplied for the guidance of medical practitioners and may be obtained on request. The containers are issued in boxes of five.

Terpoflor Nasal Capsules.—Messrs. Wilcox, Jozeau and Co., 15, Great St. Andrew-street, London, W.C., are the agents of this preparation, which is intended for the disinfection of the respiratory passages. The formula is given as follows: cedrene 0·010, pinene 0·010, anethol 0·012, terpineol 0·004, camphoric aldehyde 0·010, cineol 0·008, methyl ortho-amido-benzoate 0·007, linalyl acetate 0·004, sesquiterpenes 0·035, extra paraffin oil 0·900. It is put up in the form of gelatin capsules, shaped like an ampoule. In application the end of a capsule is cut off and the contents squirted into the nostrils, the head being thrown well back. This may be done several times a day but only on the recommendation of a doctor, as the sensitiveness of the mucous membrane of the patient as well as other idiosyncrasies may vary. The preparation is indicated in affections of the upper respiratory tract, and is claimed rapidly to relieve congestion and the disagreeable feeling of a stopped-up nose in cases of cold in the head.

Dimol Pulverette and Dimol Mouth Wash (Dimol Laboratories, Ltd., 40, Ludgate-hill, London, E.C. (Agents: Sangers, 258, Euston-road).—These are two new preparations of Dimol, a well-known intestinal disinfectant which has already been referred to in these columns. Its chemical constitution is $C_6H_2(CH_3)_2(OCH_3)OH$, and it is free from toxicity. The Dimol Pulverette is prepared according to the formula dimethylomethoxyphenol gr. 1, acid arsen. gr. 1/180, ext. nuc. vom. gr. 1/16, and will be known as T; further, to safeguard against confusion with Pulverettes A (white) and B (yellow) the new pulverette is coloured pink. Its use is that of a nerve and general tonic combined with a non-toxic intestinal bactericide. The Pulverette T is put up in glass bottles and the dose is 2 or 3 three times a day, to be taken with a draught of water immediately after meals. The mouth wash, which is guaranteed to have the Rideal-Walker coefficient equal to 20 per cent. pure carbolic acid, is put up in bottles with a sprinkler top and cap and a few drops according to taste are shaken into half a tumbler of water. The strength may be increased when used as a gargle for relaxed throat or infected tonsils.

(*Continued at foot of next column.*)

(*Continued from previous column.*)

EMPLOYMENT FOR THE TUBERCULOUS.

THE experience of the New York Tuberculosis and Health Association in finding work for convalescent cases is now available in book form.[1] This original investigation was supported partly out of the funds of the Association and partly by a grant from the Laura Spelman Rockefeller Memorial. It was found inexpedient to list trades and occupations suitable for the tuberculous. Rather it is advantageous to make a list of the conditions that must be avoided as well as those which are favourable in any occupation: "There are no industries in which *all* jobs are suitable for the tuberculous, and on the other hand, there are only a few industries which have *no* jobs suitable for the tuberculous."

ROCKEFELLER FOUNDATIONS.

THE Laura Spelman Rockefeller Memorial, which was founded by Mr. Rockefeller in 1918 as a memorial to his wife, has recently been consolidated with the Rockefeller Foundation which title is retained for the new joint body. Dr. Vincent, president of the original Rockefeller Foundation, retains that title in the new organisation. The two foundations, whose joint assets now total over $264,000,000, will continue to function, but it is hoped with greater efficiency under the united administration. The General Education Board continues as a separate body.

THE KING'S ILLNESS.

OFFICIAL BULLETIN.

(*Continued from p. 270.*)

THE following official bulletin has been issued:—

MONDAY, FEB. 4TH.

The King continues to gain strength slowly, and was able to sit up on Saturday and Sunday for a short time. The question of ray therapy has been further considered. The period of the administration of ultra-violet rays has terminated, and it will now be possible to supplement this treatment by the addition of luminous rays. (Signed by Sir Stanley Hewett, Dr. Frank Howitt, Dr. Robert Stanton Woods, Sir Hugh Rigby, and Lord Dawson of Penn.)

Practitioner.—There seems to be no safe method of permanently curing superfluous hairs other than electrolysis in the hands of an expert, who need not necessarily be a medical person.

Erratum.—The dose of pyramidon given by Prof. H. Beyer (Berlin) for fever associated with nasal catarrh (THE LANCET, Jan. 26th, p. 198) should have been stated as 0·1 gramme, equivalent to grains 1·5.

[1] Employment of the Tuberculous, by Alice Campbell Klein and Grant Thorburn, M.D. National Tuberculosis Association, 370, Seventh-avenue, New York City. Price 50 cents.

Some Thoughts ON THE NATURE OF CANCER.

ead at a Meeting of the American College of Surgeons held at Boston, Mass., on Oct. 11th, 1928,

By Sir CHARLES A. BALLANCE, K.C.M.G., C.B., M.V.O., M.S Lond.,

CONSULTING SURGEON TO ST. THOMAS'S HOSPITAL, LONDON.

THE International Conference on Cancer, which as held last July in London, evoked great interest. ientists of all nations joined in its deliberations. ie goal of effort was the discovery of the intimate ture of the disease and of the means for the pre- ntion and cure of its lethal incidence on the human ce.

When Homer told the story of Troy he did not ite prose or even history; he everywhere infused to it an incomparable ardour—he made an epic. a epic is a theme of action treated in heroic propor- ns and style. In our profession the life enthusiasms d moral qualities of such men as Pasteur and Lister esent to our minds epics of incomparable ardour. ieir struggles were great, the issues were great, the en were great. It appears to me that the hopeful le of our labours is that some of our colleagues are proaching the subject of the cause of cancer in the ic spirit. "The most important events of history e to the novelist what gigantic mountains are to the aveller. He surveys them, he skirts their base, he lutes them as he passes, but he does not climb em." In the same way I propose to survey, skirt, d salute some of the great landmarks in the history research into the nature of cancer.

Debates at the Conference.

The chief papers and debates at the London ngress dealt with the early diagnosis and the lative value of surgery and radiation in the treatment carcinoma of the stomach, mamma, uterus, mouth, d rectum, and of sarcoma of bone. There was also short statement by Dr. T. Lumsden concerning mour immunity and vaccine treatment, but the bate which interested me most was that on the iology of cancer. The use of lead as a remedy did t obtain general acceptance. There was a general eling that the rule persists that operation is sential in the treatment of cancer, but that opera- n combined with radium was, in certain cases e.g., carcinoma of the mamma—of increasing lue. For sarcoma of bone, in which amputation does it delay the fatal issue, some hopeful results were ported following the use of radium and toxins or dium alone. The biological effects of radium and rays were discussed by experts.

When I was a house surgeon it was generally thought at an attack of erysipelas after an operation for rcinoma mammæ had some effect in preventing the currence of the disease. I was in Berlin in 1884. hleisen was assistant to von Bergmann and he was fecting cases of carcinoma mammæ with the organism erysipelas. The students nicknamed Fehleisen erysipelas coccus." When the attack of erysipelas as severe the tumour might slough out. A death curred and the treatment was stopped. Fehleisen as a forerunner of Dr. William B. Coley. This gives e the opportunity of paying a humble tribute to the ansparent honesty and diligence of my friend Coley ring a long period of years in his attack on the oblem of cancer treatment. I have no doubt yself of the beneficial influence of the toxins in rtain cases of cancer.

Paracelsus held that Nature was sufficient for the re of most diseases; Art had only to interfere when e internal physician was tired and incapable. Then me remedy had to be introduced which should be antagonistic, not to the disease in a physical sense, but to the spiritual seed of the disease. I look forward to the time when our terribly mutilating operations for the cure of cancer, which must be performed at present, will be replaced by a vaccine or some such remedy which will be antagonistic to the spiritual seed of the disease. Dr. Lumsden spoke of tumour immunity and vaccine treatment. He said that antibodies could be produced which had a specific affinity for cancer cells; they attacked and killed the cancer cells without damaging normal tissue cells. After using vaccine the immunity was much higher than otherwise. He suggested that those who were treating tumours with radium should not be in a great hurry to get rid of the local growth by sloughing, because this would prevent the increase of immunity.

It has long been known that most tumours in the commonly used experimental animals retrogress after a time, and that such animals are immune and cannot be further successfully grafted. Many years ago at the Buffalo Cancer Laboratory I saw mice which had in this manner become immune. This is not at all comparable to the retrogression of spontaneous tumours. Hence the same observation is rare in man. Many surgeons of much experience have observed the slow disappearance of a malignant tumour.

No one of us doubts the importance of the early diagnosis of malignant disease. But when a cancer gives a sign or a symptom it is not in the early stage of growth. I have no faith in what has been termed the pre-cancerous stage; to me either a patient is suffering from malignant disease or he is not. I am all in favour of the intensive education of the family doctor concerning all newly discovered facts which may aid him in early diagnosis; but I am not in favour of lecturing to men and women of the lay public on a subject which they cannot in any measure understand, and which is with them ever associated with fear and dread. Fear and dread depress the resistance of the body cells and like injury may be the partial cause of the disease.

The debate in London on the early diagnosis of cancer of the stomach and on the value of excision of simple ulcer of the stomach as a preventive measure was of much interest. I would only add this: none of us is possessed of a knowledge which can allow him to state—this simple ulcer will become malignant. The prophet is a bad guide in surgery. Furthermore, I am convinced of the immense value, in selected cases of simple ulcer of the stomach, of a posterior no-loop gastro-enterostomy, the operation which we owe to your great surgeon, William J. Mayo.

External Agent as the Cause of Cancer.

In 1884 I joined the first class in bacteriology ever formed in the ancient University of Leipzig. The teacher's name was Becker, who was Koch's first assistant. The class was held daily for six weeks and was a great success. Becker insisted that Koch's four postulates must be fulfilled before any living organism could be held to be the cause of the disease. This is as true to-day as then. My family had been decimated by malignant disease, and as a student I had made up my mind, when opportunity offered, to work at its intimate pathology. When I returned to England I met the late Prof. S. G. Shattock, who was a microscopist, and we started together on the great adventure. Sir John Simon and Sir James Paget and other great pathologists of the mid-Victorian era had noticed the vital difference in activity of the normal and cancerous epithelial cell. Speaking generally, the cancerous epithelial cell is indistinguishable anatomically from the normal epithelial cell, but its physiological life is different. The one has a normal life, but some profound change has happened to the cancer cell. It has become endowed with an immortal life and the property of endless growth. In those early days it was suggested that some outside spermatic influence caused the change in the epithelial cell which gave to it an immortal life. Whatever takes place in our bodies has two distinct factors—the intrinsic factor, which is the constitutional or

resisting power of the cells affected, and the external injurious agent. The spermatozoon, meeting the right ovule, may create a life—a sort of other life or parabiosis. I have always inclined to the belief that an external agent is the essential cause of carcinoma; that the infected epithelium is the habitat of the external agent, and that it will live and grow in none other.

In carrying out a research on the intimate nature of any disease it is essential to have an hypothesis of the nature of the disease in order to plan a scheme of work. The only scheme of work on the intimate nature of cancer which offers a prospect of success must be based on the hypothesis that some external agent is the essential cause. If it were possible, which it is not, it would be well if all our experimental work on the intimate nature of cancer could be carried out on carcinomata, since certain types of round-cell sarcoma are not easy to distinguish microscopically from granulomata, while the microscopical appearances of the carcinomata are so definite that no mistake is likely to occur. It is quite possible, and indeed probable, that the same external agent is the cause of both sarcoma and carcinoma. In the one case it finds a habitat in the mesoblastic cell, and in the other in the epiblastic or hypoblastic cell. Sir James Paget long ago pointed out that the same insect produces different kinds of galls according to the different sites of oviposition.

The view that sarcoma and carcinoma have a common origin receives support from the tale of a case reported in 1926 in the *Annales d'Anatomie pathologique* by Lècase and Lacassagne.

In 1923 a woman was operated on for advanced carcinoma mammæ. Two weeks afterwards a student of medicine, aged 21, was told to remove by a syringe fluid collected under the scar. In doing so a sudden movement of the patient caused the needle to be driven deeply into the palm of the hand of the student, and a small amount of the fluid in the syringe also entered the palm. Two years later there was a hard swelling with pain in the palm of the hand and glands in the axilla were enlarged. A little later several small tumours appeared in the forearm and arm and amputation of the limb was performed.

The beautiful illustrations accompanying the paper show clearly that the mammary tumour was a spheroidal-celled carcinoma, while the tumours which grew in the student's hand and arm were spindle-celled sarcomata.

Comparison with Tuberculosis.

When I was a student anthrax was taken as the standard of comparison in pathological mycology. Let us take tuberculosis as the standard of comparison in the study of malignant disease. The late Dr. Bristowe compared cancer with other infective diseases and stated that in his view every general specific disease begins as a local process. This is true of both tuberculosis and cancer. The clinical history of sarcoma or carcinoma is so closely akin to that of tuberculosis that it is quite within the truth to assert that there is no feature in the last-named disease which is not paralleled in the others. Before 1881 the authorities regarded tuberculosis as a disease with many causes. To-day some authorities regard cancer as a disease of many causes and the specific organism remains undiscovered. But the analogy between tuberculosis and cancer is perfect, and repudiation of the analogy leads only to despondency and despair.

The endemic location of cancer comprehending sarcoma and carcinoma, about which much might be said, is a highly remarkable fact in the history of malignant tumours.

The phenomenon of atavism has been observed both in tuberculosis and cancer. "Parents seemingly healthy may beget a family of children who all die of phthisis. The taint is latent in transitu." It is within my knowledge that whilst the first and third generations of a particular family were devastated by cancer, the second wholly escaped. Paget wrote: "The tendency which exists in the parents may never become in him or her effective, although it may become effective in the offspring." These events appear result from temporary impoverishment of the peculi soil; or the atavism might depend not on the subje but on the parasite itself, the life of which mig present an instance of alteration of generations. T phenomenon indeed may be comparable to that whi necessitates in agriculture a rotation of crops. carcinoma the primary tumour is seated mo frequently at sites where an infection from witho would most readily take place. The metastasis lymphatics or blood-vessels in carcinoma or sarcon is such as occurs in tuberculosis. It may be restrict to the lymph glands or be as widespread as a generalis tuberculosis (general sarcomatosis or carcinomatosi Even the glandular infection which occurs at times tuberculosis without primary lesion has its counte part in the squamous-celled carcinoma of the inguin glands in chimney-sweeps, in whom there may no discoverable primary growth. The latency glandular infections is equally represented in tub culosis and carcinoma. The sarcoma that grows the end of a long bone after injury is comparable wi the tuberculous osteitis ensuing under similar circu stances. Injury is the partial factor; the oth factor in the case of tuberculous osteitis we know be a specific virus. The relation of injury to tumo growth is illustrated by the case of a patient who f striking the forehead against a sharp iron spike. T spike perforated the skull and brain. Death occurr eight months later. The cause of death was ange sarcoma of the meninges and brain. The patien brain would seem to have been inoculated at the ti of injury with the virus of malignant disease as sur as a tube of culture medium is inoculated by plungi into it a platinum point deliberately charged wi infective material.

Carcinoma has sometimes a purely local origin the same way that a tuberculous infection may ar from direct inoculation. Take, for example, a case squamous-celled carcinoma of the lip. While stil local disease it may be completely eradicated. T case, in fact, is directly comparable to one of lo tuberculosis from direct inoculation or to exter anthrax, which is still a local process, and might termed one of local carcinomatosis. Local irritati and injury are sometimes spoken of as causes cancer. But this is not so. The efficient cause l beyond the irritation or injury which are but the part causes of the disease. The injury prepares a nutrie soil favourable for the growth of the tubercle bacil or the effective agent of malignant disease. Her itary predisposition or diathesis is nothing more th the presence in the body of a soil suitable for t growth and development of the virus.

Many examples of auto-inoculation have long be recognised, such as cæcal carcinoma, associated wi numerous lesser growths in the colon or an œsophag carcinoma associated with several small growths bel the primary tumour. These multiple small growt point to the possibility of an auto-inoculation of t same kind as occurs in tuberculous ulceration of t intestine. Such facts prove that the cancero epithelium has been transferred as a graft, but it do not prove the presence of a parasitic virus. It pro only that the cancerous epithelium cell or the ag which made it cancerous is infective.

When tubercle spreads through the body from primary lesion all the secondary lesions are typical f the disease and contain the virus of it. The spec anatomical characters of the secondary growths carcinoma are ample proof of their source from t primary tumour. In sarcoma the best proof of t same fact is furnished by the melanotic variety, wh the pigmentation of the secondary tumours is sufficie evidence of their origin from the primary growth.

Experimental Research.

After the rise of modern bacteriology strenu efforts were made to cultivate a specific microph from carcinoma. The results were uniformly ne tive. The failure of evidence in this direction to the suggestion that the hypothetical mic

asite might belong to the animal series, but the eriments in this direction were also negative. v is the infection communicated to the epithelium ne carcinomatous parasite is a protozoon? How he function of the first infected epithelial cell nged from a benign to a so-called malignant racter? It may be in one or more of the following 's: (1) By absorption of a chemical product ch is secreted by the parasite. (2) By the passage the epithelial cell of the organism, the latter ntaining a separate existence in the former. By the process of rejuvenescence in which the ging life of a protozoon is revived by means of on with another.

What happens to the epithelial cell first infected? ough single binary division is the chief mode of oduction another method of multiplication is by nipping off, or budding, of spores from the parent It is also not uncommon for a protozoon to ık up into from 10 to 100 or more pieces or spores. h piece contains all the elements of a perfect cell. he carcinomatous cell has a similar life-history pieces or spores of the subdivided epithelial cell each grow into an adult carcinomatous cell, or be thought of as conjugating with the surrounding nal epithelium, and of being the *fons et origo* in n of a carcinomatous rejuvenescence.

n sections of carcinoma there are certain appear- es in the cells which were thought years ago to cate the presence of a protozoon. I may cite the ers of Noeggerath, Soudakewitch, Foa, Ruffer, and lwig Pfeiffer. The opinion of Metchnikoff was that appearances indicated nuclear degeneration. I do know whether the virus of Gye belongs to the etable or animal kingdom, but if we suppose that as its habitat in the nucleus of the cancer cell (and e are some reasons to think that this is so, ugh at present the optical difficulties of demon- ting it seem insurmountable) it is possible that ie of the previous microscopical researches on the leus of the cancer cell may not have been all tless. Indeed it may be asked why should the lei of the actively growing cells at the periphery a malignant growth show signs of degeneration? failure to transplant human carcinoma to the er animals might be due to the fact that it is essary for the parasite to assume a phase outside human host in order to transmit the disease. s side of the problem has not been perhaps iciently explored.

s germane to this point Prof. Shattock and I carried a series of experiments with the object of seeing whether erimental infection could be brought about from the ospermial bodies so common in the rabbit's liver. We e led to do this after Darier's description of the presence sorospermia in the epidermis in Paget's disease of the le and the alleged association of psorospermia with inoma in general. The experiments were performed upon bits, monkeys, dogs, and rats. The chief experiments e performed on rabbits as being most likely to receive ction. Intravenous and other methods of introducing psorosperms were employed, but in no case was the nal infected.

f the positive results attained do not prove the stence in malignant tumours of an external agent must be borne in mind that the negative do disprove it. They show only that the methods ployed to demonstrate it were not suitable. method of transmission in infective diseases ot always so direct and simple as such grafting eriments presuppose. It has been shown, for mple, that malaria cannot be transmitted between ls by the injection of blood containing the hæma- oon. It has been shown, too, that the capsule of encapsulated protozoon consists at times of chitin of cellulose. Both of these substances are absent n the tissues of vertebrates. Further pathogenic teria produce in cultures albumose. Neither tin, cellulose, nor albumose can be demonstrated in arcinomatous tumour.

Though it has not been possible to transfer human cinoma to the lower animals it is well known t carcinoma can be transferred from animal to animal of the same species, and even from man to man.

One of the best and earliest examples of transference from animal to animal was recorded by Hanau, who successfully engrafted squamous-celled carcinoma from a rat into a series of other rats. In one experiment small portions of the tumour were placed in the abdominal cavity. Death ensued after three months and the abdominal cavity was found at the autopsy filled with nodules which presented the typical structure of squamous-celled carcinoma. Dr. Hanau showed me microscopical sections of the growth which was placed in the peritoneal cavity and also sections from the growing nodules taken after death from the peritoneal cavity. All the microscopical sections showed a squamous-celled carcinoma of the same type.

Since Hanau's experiment numerous investigators have worked intensively on the intimate pathology of cancer, and the discovery of the filterable viruses has opened out wider fields of research.

In 1913 Fibiger published a research on cancer of the stomach in rats. He was the first to cause experimentally a malignant growth. The ingestion of cockroaches infected with a special spiroptera, or the ingestion of the nematode larvæ obtained from the muscles of the cockroach, produced squamous-celled carcinoma in the cul-de-sac of the stomach. The eggs of the parasite were found free between the epithelial cells of the cancer. The cockroach is the intermediate host.

Virus or Enzyme.

In London at the conference debate on the ætiology of the disease the main discussion centred on the work of Rous, Borrel, Murphy, Gye and Barnard, and Leitch. Dr. Murphy said that now after many experiments the real nature of the cancer agent seemed to be emerging. He said that it was possible to extract with a considerable degree of regularity from the normal testes of the fowl a substance which, when injected into a normal fowl, would produce a malignant new growth. Dr. Murphy's belief is that the external agent is an enzyme, not a virus. Prof. Leitch supported the view of Dr. Murphy and stated that he had obtained a typical Rous sarcoma by the injection into a fowl of an extract of a normal fowl pancreas. The statements of Dr. Murphy and Dr. Leitch did not carry complete conviction to my mind. I am by no means convinced that the experiments of Murphy and Leitch constitute a final settlement of the work of Gye. Whether the causative agent is a virus, as Gye maintains, or an enzyme, as Murphy and Leitch hold, its most remarkable quality is its specificity in action. This specificity enables it to produce invariably the same type of tumour as that from which the agent was obtained. What does emerge is that the best workers in this field of pathology are agreed that there is an external agent concerned in the production of cancer.

Sir William Bragg, in an address to the British Association for the Advancement of Science last month, reminded his audience that in the nineteenth century light was regarded as a series of waves in an all-pervading ether. This theory was based on profound mathematical analysis and brilliant and far-ranging observations. Sir William added that there is no question of its truth in the ordinary sense. But in the twentieth century a new field of optical research had been opened up and had led to the inference that light had many of the properties of a stream of minute particles. This theory has passed the experimental test, and many experimental facts, inexplicable on the wave theory, are explained by the particulate theory. But how can anything be at once a wave and a particle? As yet there is no hint of reconciliation.

The dilemma is a rift in the whole fabric of scientific certainty. Is not the biologist in the study of the nature of cancer up against a dilemma which may be compared to that which now agitates the physicist? Virus or enzyme? Particle or wave? But there is hope of escape, as the *Times* suggested, for the scientific methods which have revealed it are still only scratching the face of the unknown. When bacteria were first recognised as the cause of disease it was thought that their presence alone induced

the disease. It was not till later that disease was discovered to be due to a specific chemical poison secreted by the bacteria. What is an enzyme? I do not know, but I do know that any active substance in the body—for example, a ferment—is manufactured by a living cell. This truth brings the virus and enzyme theories into close relation. Spontaneous generation being excluded, the crucial question is: What of the cell which manufactures the enzyme of Murphy? I am indebted to Dr. C. H. Andrewes for permission to refer to his work, which will be published this month.[1] He has repeatedly precipitated vaccine lymph and the final extract remains effective in the production of vaccinia. Dr. Andrewes states that the process can be repeated indefinitely. No one can suppose that the globulin precipitates are, *re* globulin, the cause of vaccinia. It is clear that the virus has passed through all these stages of the purification of the original material without losing its specific character. In the same way I suggest that the frequent precipitations employed by Murphy in the case of the extract of fowl testes, which he believes frees the resulting fluid from the virus of malignant disease, fails to do so. The reasonable conclusion is that the precipitated neo-protein carries the virus with it. The fact that in certain cases the virus of fowl sarcoma is to be found in the testes of this creature presents little difficulty to my mind. It is only an interesting observation, for we know that the organisms of disease lie latent in our bodies. Otherwise it would not be possible to explain after injury to the testicle or to a joint the occurrence of tuberculous epididymitis or tuberculous arthritis.

The rare tumour chorionic carcinoma occurs in the uterus and occasionally in the Fallopian tube and ovary. When the Fallopian tube or ovary are affected it may be presumed that these organs have been the seat of early ectopic gestation. The tumour occurs at any age within the limits of possible pregnancy. It would seem that the spermatozoon carried with it into the mature ovum not only its natural growth-producing power, but also the external agent of carcinoma. It is possible that the spermatozoon in chorionic carcinoma is the host of this agent which is the essential cause of carcinoma. As germane to this view, it may be remembered that chorio-epitheliomatous elements are found in certain testicular tumours.

When I entered the profession the members of the Pathological Society of London were engaged at their meetings in showing specimens of disease obtained from the post-mortem room. But the times were changing. The work of Pasteur and Lister had begun to permeate the profession. Anæsthesia had been discovered. Gross disease could be examined in vivo and not only on the post-mortem table. The great age of dead meat pathology was passing away and in its place a living pathology was arising whose aim was the study and discovery of the intimate causes of disease.

I have already mentioned that as a working hypothesis in the search for the cause of cancer I pin my belief to an external cause. In all diseases where the pathological anatomist has the authoritative voice intrinsic causes are sought after and extrinsic causes are relatively neglected. The idea of a specific extrinsic cause of any disease has owed its origin either to non-medical men like Pasteur or in later times to bacteriologists; pathological anatomists have never embraced the idea enthusiastically. Indeed they have generally resisted any encroachment from this direction upon their special domain. I remember the opposition of the great Virchow to the opinion that tuberculous disease owes its origin to a specific microbe; his opposition, in spite of his unrivalled authority—an authority no man could support now—was broken down because of the relatively simple and easily verifiable bacteriological findings of Koch. If the demonstration of the tubercle bacillus were entirely dependent upon animal experimentation of a complex character, depending f interpretation upon acute insight into the path logical problem, and upon scientific imagination estimating probabilities, I doubt whether to this d the opposition, now proved to be reactionary, of t morbid anatomist would have entirely disappeared.

In 1880 I attended a lecture by Sir John Burd Sanderson. The subject was the Nature of Scrofu He described how he had gathered dust from S Paul's Cathedral, from Westminster Abbey, and fro his own drawing-room, and how it had been plac under the skin of a series of guinea-pigs. The resu we were told, was that all the guinea-pigs we infected with scrofula, and that the disease could n be a specific one, as the specific agent could not supposed to be in all these three places at the sa time. I and my friends left the lecture theatre feeli that the argument was not conclusive. The followi year Koch demonstrated the tubercle bacillus.

Limitations of Morbid Anatomy.

In considering the problem of the cause of can I am not disposed to attach great weight to t opinions of those who merely study appearances dead tissues under the microscope. I accept with d thanks their contribution towards the pathologi definition of the fine structure of the cancer cell, b I am not prepared to be governed by their theori It is to animal experimentation that we must look f the solution of this mysterious problem. The pione of cancer investigation—Jensen in Denmark, Bor in France, and Loeb in America—confirmed t earlier studies of men like Hanau who had sho that animal cancer differs in no respect from hum cancer and may be transmitted from animal to ani by the process of grafting. They showed, howev as the late Prof. Shattock and I did, that all t cancers studied gave no evidence of a cause separa from the cell. The cell appeared to be the indivisi unit of the disease. These observations, confirmed experimenters all over the world and especially on large scale and with great exactitude by Bashford a Murray in London, gave no encouragement to th who believed in an extrinsic cause of the disea Some were overwhelmed by the apparent completen of the proof—or really by the absolutely negati character of all attempts to find an extrinsic cau Even Borrel, one of the earliest and most energe pioneers and a believer in the microbic cause, w nearly swept under by the wave of confident dogmati which teaches that the disease cancer is a cell in whi nuclear degeneration independent of microbic activi has occurred. Borrel was never able to accept t sweeping conclusion and endeavoured to res orthodox opinion. He stood almost alone for a lo time, neglected and powerless.

The tremendously strong dogmatic world-opinion still uppermost, but not all-powerful. Murmurs discontent with the stagnant stage of cancer resear have been heard in every country. In England t formation of the British Empire Cancer Campaign ow its origin largely to the existence of the feeling th new blood was required to study afresh the origins cancer. Doubtless in America you have felt somewh similarly. This murmuring of opposition to t authority of the pathological anatomist has fou expression in attempts to get behind the problem cancerous growths by instituting departments biophysics, biochemistry, and so forth. But it not very likely that the true solution of the probl will come from oblique investigations. The study cancer must be direct. But since the investigatio of cancer institutes have proved so barren in th negativeness, where shall we look for the lead in t great problem?

During the last three years there has been mu discussion and more criticism of the researches of r countryman Gye. Now I should like to express r views on this matter. At once I must make it cl that I am not competent to discuss all the details such work; I can give the reflections of one who h witnessed the fluctuations of medical opinion duri

[1] The paper referred to was published in the Jour. Path. and Bact., October, 1928.

years and has seen that which was abused, epted, and proved true.

can look back to a period of research beyond that ch embraces the lives of most of my hearers. ave heard Virchow, Helmholz, and Ludwig lecture, I have seen Pasteur and Lister and Paget at k. I was a distressed and angry witness of the position and abuse which assailed Pasteur and ter in the early days of their immortal labours.

he first point in Gye's work is this, that he sees lead in cancer investigation to lie in the study of remarkable group of fowl tumours which were brought to light by Dr. Peyton Rous, of the kefeller Institute. They are the exceptions in cers in this, that they give evidence of a cause; , as has happened so often, exceptions to general s are likely to yield new knowledge which extends eral laws. The work of Peyton Rous in proving the plastic nature of these fowl tumours has been perly acknowledge by Gye, who has sought to erstand the nature of the cause of these tumours to link together the fowl and the mammalian nours.

he essential claim which Gye makes is this, that clear cell-free filtrate which is obtained by acting a fowl tumour with saline, and which tains the tumour's cause, is not a simple single g. The "agent" of the tumour is complex. Now the experiments which have been published in support of this contention have met with but little support. But if one takes into consideration the very, very delicate nature of the tumour agent, the fact, for example, that it disappears or becomes impotent after mere incubation at 37° C. for a few hours, and that it is only demonstrable with the highest power of the microscope and with the use of ultra-violet light, it is easy to understand that the difficulties of the work are very considerable. Gye believes that the evidence he has adduced is good enough, at least as a first approximation to the truth, to show that the virus found in the fowl tumours is common to many animal and human tumours.

Conclusion.

I cannot form a definite opinion upon all these technical matters, but I have been for 50 years intensely interested in, and have done a little work on, the problem. I would put forward this point for your consideration. It is not sufficient for anybody who is deeply concerned with the cancer problem to be merely destructive in criticism; it is the duty of critics to find some other explanation of the peculiarities of the cancer problem if Gye's turns out to be wrong. At present it is the only explanation which fits together a series of apparently irreconcilable observations.

THE DIAGNOSIS OF EPTOMENINGEOMA OF THE SPINAL CORD.

WITH A REPORT OF THREE CASES SUCCESSFULLY TREATED.

By THEODORE THOMPSON, M.D. Camb., F.R.C.P. Lond., F.R.C.S. Eng.,
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[OST organic lesions affecting the central nervous em are progressive, do not readily respond to tment, and carry with them a grave ultimate gnosis. The treatment consequently becomes iative. This, however, is not true of lepto- ingeoma of the spinal cord, where the treatment, if ied out early, leads to cure. The importance of y diagnosis, therefore, becomes paramount. It is when surgical measures are resorted to before plications are superadded and permanent damage resulted from compression of the cord that we promise the patient permanent relief from the ressing symptoms. Before emphasising certain ortant factors presented in the symptomatology his condition, a report is given of three cases essfully treated.

The First Case.

spinster, aged 50, first came under my care in August, . At the age of 14 she had had tuberculosis of the right v and left foot, which had necessitated excision of the v-joint and amputation of the left big toe. She had enjoyed good health until May, 1921, when she com- ied of backache. The pain, situated in the centre of back in the mid-dorsal region, was severe and occasion- sharp and accentuated on movement. There was at time no weakness nor sensory disturbance in the lower mities, and no history of bladder trouble. Muscular r and sensory function in all the limbs were normal; plantar response was flexor and the knee-jerks were slightly exaggerated. X ray examination of the back osed osteo-arthritis of the spine with prominent lipping e vertebral bodies.

ith a diagnosis of osteo-arthritis of the spine, the nt was sent to Buxton for treatment. Whilst there noticed numbness in the lower part of the abdomen, nencing on the right side and later spreading to involve feet. This was followed by weakness in the legs cially the right) resulting in great difficulty in walking pain in the back was severe only on movement and ined localised, and accompanied by local tenderness. modic movements of both legs prevented the patient sleeping at night. These symptoms increased, and when she was re-examined on Oct. 2nd, 1921, there was complete loss of power in the right leg and considerable weakness of the left. Both limbs were spastic, the deep tendon reflexes were increased, abdominal reflexes were absent, and the right plantar response was extensor. Ankle-clonus was present on the left side. There was complete loss of sensation to pain, heat, and cold on the left side as high as the ninth thoracic segment, while on the right side there was numbness to pin-prick only. For the past three days the patient had experienced difficulty with micturition, and for 24 hours there had been complete retention. Four pints of urine were withdrawn by catheter.

A diagnosis of spinal tumour was made, and on Oct. 5th laminectomy was performed by Mr. A. J. Walton. A localised tumour, exposed between the seventh and eighth thoracic segments, was found compressing the spinal cord and was easily removed. (Fig. 1.) The patient made a steady and uninterrupted recovery. A month after the operation she could move both legs and stand unsupported, and had regained complete control of the sphincters. Three months later she was able to walk a hundred yards without support and, apart from occasional cramp-like spasms in the legs at night, was free from any discomfort. She improved steadily, and ten months after the operation she had returned to work as head-mistress of a school with 130 girl pupils. In the summer of 1926 she had done a great deal of walking in Lugano, Chamonix, and Grenoble, including several "good climbs." When examined in January, 1927, the movements of the lower limbs were good, there was no rigidity, and the plantar response was flexor. A little numbness at the level of the seventh dorsal vertebra was the only sensory change remaining. When next seen, during the summer of 1928, her condition was excellent.

The specimen removed at operation was examined by Prof. Hubert M. Turnbull, who made the following report:—

Macroscopic Examination.—The specimen (S.D. 1646, 1921) was oval, measuring 2·5 × 1·5 cm. and 0·8 cm. in its greatest thickness. The surface was covered with delicate, blood-stained, fibrous tags. The cut surface showed a very thin, white capsule surrounding a moderately soft, pale brown, somewhat granular tissue, in which there were a few reddish brown areas and small cysts.

Microscopic Examination.—The mass was bisected, and one-half was fixed in 2 per cent. saline formaldehyde and embedded in paraffin. Sections were stained with Ehrlich's hæmatoxylin and eosin, by Van Gieson's method and Masson's modification, with Weigert's fuchselin and neutral red, by Perl's method, by the Weigert-Gram method, with Masson's trichromic stain C, and with Mallory's phospho-tungstic acid hæmatoxylin after Zenker's fluid. The portion of tissue is approximately semi-circular, the convex surface being an outer surface covered with blood and the straight surface a plane of incision. The tissue is in places compact, but is for the most part rarefied to a variable degree by œdema; small and large confluent, round cystic spaces lie within the most rarefied areas. It contains several areas of recent hæmorrhage and a very large number of cells

loaded with iron pigment. The compact areas are composed of interlacing bundles of parallel, spindle cells. The bundles enclose vessels, and the cells are usually directed in the long axis of the vessel. There is frequently a zone of polygonal cells immediately round the vessel; occasionally a zone of short spindle cells arranged radially. The nuclei are usually oval, being elongated and narrow in the long spindle cells. The nucleus has a delicate membrane, a close net of very delicate chromatin fibrils, and a few large nodes of small nucleoli. The spindle cells are very long and narrow. Their cytoplasm in ordinary stains appears to consist of longitudinal fibrils, and is ill-defined. In Mallory's hæmatoxylin numerous delicate, somewhat wavy fibrils are stained in places. Some of the vessels have a narrow wall of delicate, collagen fibrils. Most have a wide wall of hyaline collagenous tissue containing a few cells; the wall is usually sharply defined, but sometimes delicate collagen fibrils extend for a short distance between the surrounding cells.

In the rarefied areas the shapes of the cells become more clearly seen the more the cells are separated from one another, and sharply defined fibrils are conspicuous in Mallory's hæmatoxylin. Most of the cells are very large and have the form of long tapering spindles, spindles forking at one or both extremities, triangles with one or all angles extended, or pears with elongated stalk. Less common are cells which have little cytoplasm and are either of similar shapes with curtailed processes or approximately spherical. Fibrils course within the large cells, particularly along the margins, and the cytoplasmic processes end in very long fibres. Between the cells is an abundant feltwork of sharply defined fibrils. In places this feltwork is very dense; there the cells are usually scanty and small, and are occasionally definite astrocytes. The cystic spaces contain a tangle of delicate, feebly stained fibrils, and have no definite lining. The fibrils are dark blue in Mallory's hæmatoxylin, red in Masson's trichromic stain, and Gram-negative. The outer surface is bounded in places by a narrow zone of collagenous fibres among which are no elastic fibrils. Beneath the surface are a few veins with fibro-elastic walls, and one large muscular artery surrounded by a wide adventitia of stout collagenous and a few elastic fibres.

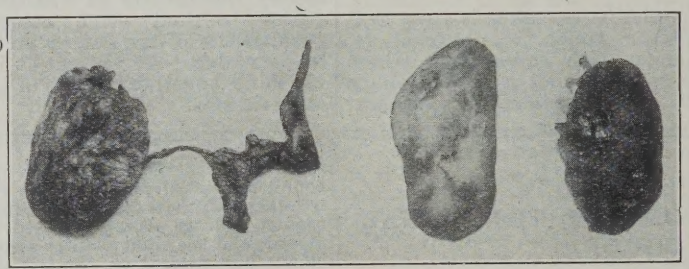

FIG. 1.—Tumour with portion of pia mater attached removed in Case 1.
FIGS. 2 and 3.—Tumours removed in Cases 2 and 3. (Natural size.)

The tumour consists of atypical neuroglia; it is therefore a gliosarcoma in the less restricted sense of this term. The enclosed artery is unlike the arteries within the spinal substance, so that the tumour involves the meninges and has probably arisen therein. The tumour is an intrathecal, hæmorrhagic, œdematous, cystic gliosarcoma, probably of leptomeningeal origin.

The Second Case.

Female, aged 48, first came under my care in January, 1927. She was married, with eight healthy children. For six years she had suffered from "neuritis" in the legs and feet, and for the last 12 months had noticed weakness and stiffness in the left leg and ankle, and these symptoms had slowly but steadily increased. She also complained of severe cramp-like pains in the calf of the left leg, frequently accompanied by uncontrollable spasmodic flexion at the knee. When walking she had noticed that the left ankle kept turning outwards, and for this reason she was believed to have flat feet. For two months the right leg had been numb and cold and the site of occasional sharp pain. There was also difficulty in commencing the act of micturition, but no incontinence.

The patient was a strong, heavily built woman. Examination of the heart and lungs disclosed no abnormal physical signs. The left leg showed slight general wasting and was cold, and gross spastic weakness of all movements was present. The right leg, although exhibiting slight spasticity, showed no obvious weakness. All the abdominal reflexes were absent, and the knee- and ankle-jerks were exaggerated on both sides, especially on the left. Both plantar responses were extensor. There was loss of sensation to pain, heat, and cold up to the level of the seventh thoracic segment on the right side, and these sensations were delayed in the left leg. Sense of touch was not impaired in either leg. There was gross impairment of sense of position in the left foot and some in the right. There were no sensory or motor changes in the upper limbs. The blood count was norm The Wassermann reaction in both blood and cerebro-spi fluid was negative. The cerebro-spinal fluid was not un pressure, was clear, and contained no excess of protei the cell count revealed 20 small lymphocytes per c.m An X ray examination of the spine revealed no abnormal in the vertebræ.

On Jan. 26th, 1927, 2 c.cm. of lipiodol were injected i the cisterna magna through the atlanto-occipital spa Subsequent radioscopic examination of the spine show that the lipiodol was held up at the level of the first thora vertebra for about two and a half hours (Fig. 4), t then it gradually trickled past, and that after three ho it had completely passed to the bottom of the dural s After the injection the symptoms became rapidly wo Two days later there was complete loss of power in b lower limbs; the pain and spasms in the legs had disappear and incontinence of both urine and fæces was present. sensory changes had increased in distribution, and a defi zone of hyperæsthesia was present at the level of the secc thoracic segment.

Laminectomy was performed by Mr. A. J. Walton Feb. 4th, 1927. Incision of the dura mater revealed a tum on the left side of s compressing the spi cord at the level the third thora spine. The tum (Fig. 2) was rea removed. The pati made a steady recov and soon regained c trol of her sphinct When examined May 31st, 1927, was able to stand supported and to w a few steps unai When last seen, October, 1928, she able to walk a dista of one and a half m without feeling t There was no and no difficulty micturition. When placing her feet in a warm bath still appreciated the heat more readily on the left than the right side. The tendon reflexes were present and e on both sides. Ankle-clonus was not elicited. The pla response on the left side was flexor, but extensor on right. Sensation on the left side was normal, but pin-p on the right side was only appreciated as touch up to level of the third thoracic segment.

The specimen removed at operation was exami by Prof. Turnbull, who made the following report

Macroscopic Examination.—The specimen (S.D. 1927) was received in formaldehyde solution. It was and measured 2·5 × 1·2 × 0·9 cm. One surface was co and irregularly nodular, the other flattened and sli concave. The surfaces showed a few fibrous tags, part larly the concave surface, and were yellowish-white ex for one glistening white area (0·6 cm. diameter), and b side a dark grey area (0·3 cm.). The cut surfaces white, mottled with a few irregular, greyish-brown a and faintly granular. On one cut surface was an are friable brown substance.

Microscopic Examination.—The nodule was bise One half was further fixed in 2 per cent. saline formalde and embedded in paraffin; sections were stained by same methods as in the preceding case. The section the oval shape with one flattened surface described ab but the convex surface is not nodular. The mass is posed of strands of spindle cells with narrow elongated nuclei, which stream in various directions and occupy periphery of large and small whorls of shorter spindle or rounded groups of lozenge-shaped or polygonal cells larger oval or round nuclei and less abundant cytopl Small whorls of concentrically arranged cells are com The rounded groups of polygonal cells bear a super resemblance to epidermal epithelium.

The nuclei have a deeply stained, slender membran abundant net of delicate fibrils of chromatin, nume small but conspicuous nodes, and one or more small nuc The nucleus usually occupies between a half and a thi the total area of the polygonal cells. The limits of the are usually very ill-defined, but are sharp where the are dissociated. The cytoplasm is stained readily; u high powers it has a finely fibrillated appearance, particu in the elongated spindle cells; but there are no de fibrils of fibroglia or neuroglia.

There are a few small vessels, with walls compos delicate collagenous fibres and an internal elastic memb

most of the vessels have a swollen hyaline collagenous
l containing a swollen elastic lamina or laminæ, and
e are transitions from partly occluded vessels of this
l to solid hyaline cylinders which are stained diffusely
Weigert's fuchselin. There are a few calcareous spheres,
ounded by a zone of hyaline collagen and elastic laminæ,
evidently formed within occluded vessels.
1 the central part of the concave surface is an area where
specimen has evidently been detached. All the rest of
surface is covered by a conspicuous layer of stout

grown-up children, and there had been no miscarriages. For seven months the patient had suffered from numbness of the feet, particularly of the left, and this had steadily spread upwards to the calves. A month later she complained of cramp-like pain in the left loin and occasionally in the left leg, and also a constant aching pain in the middle of the back, which radiated round to the left side and became worse when in the recumbent position. There was also some weakness and stiffness of the lower limbs. There had been no sphincter trouble of any kind.

FIG. 4.

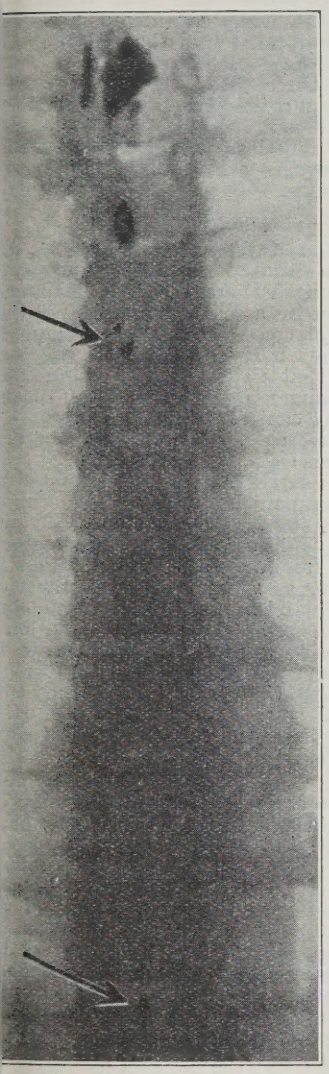

FIG. 5.

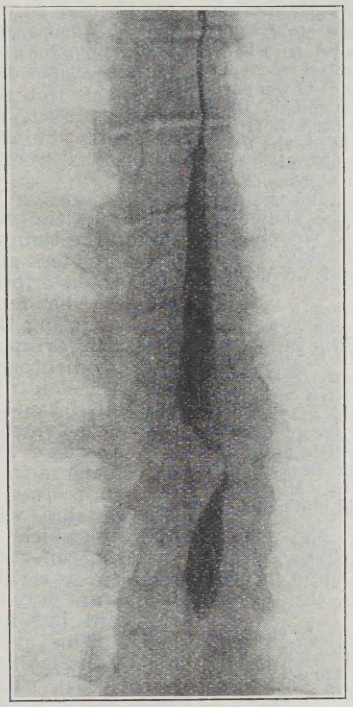

FIG. 6.

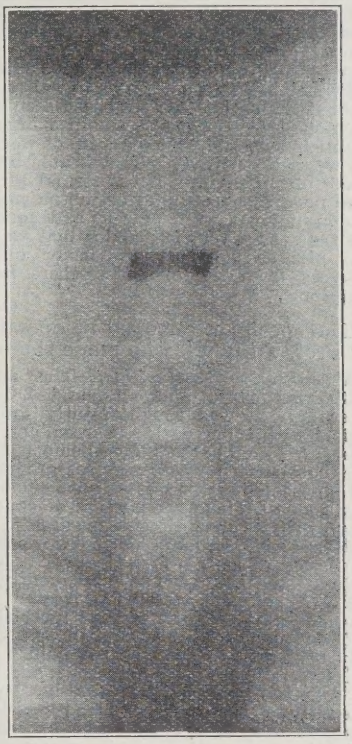

FIG. 4.—Film taken two hours after lipiodol injection in Case 2. The lipiodol is held up at the level of the first thoracic vertebra. The arrows indicate droplets of lipiodol falling to the sacral level.

FIG. 5.—Film taken three-quarters of an hour after lipiodol injection in Case 3. There is delay at the eighth thoracic segment and the lipiodol stream is deviated to the right.

FIG. 6.—Illustrating the appearance of the arrested lipiodol in a case of intramedullary neoplasm.

inæ of collagen, each of which is covered by elastic
ils. The inner laminæ are usually separated to a greater
esser extent by groups of cells similar to those already
cribed, and in a few places these cells extend right through
fibrous layer to lie upon the surface. Elsewhere the
er laminæ are closely opposed, and very narrow spindle
s lie between them.
'he tumour has the characteristic appearances of an endo-
lioma of the meninges, is covered by dural tissue, and
evidently projected like a mushroom with short stalk
n the inner surface of the dural theca. It is a cylindro-
tous, slightly psammomatous endothelioma of the dura.

The Third Case.

'emale, aged 56, a widow, first came under my care in
ruary, 1927. She had always enjoyed very good health
il two years previously, when she became very worried
l run down owing to her husband's illness. Twelve months
r he died of tuberculosis. There were two healthy,

The patient was a tall, thin, intelligent woman. There was no evidence of disease in the heart, lungs, or abdomen. The cranial nerves were normal. There was no weakness of the upper limbs, the tendon reflexes were present and equal, and there were no sensory changes. The abdominal reflexes were absent on the left side and present in the upper segment only on the right side. There was slight spasticity of both lower limbs, together with weakness, affecting especially the extensors of the legs and feet. There was no wasting. The knee- and ankle-jerks were exaggerated. These signs were more marked on the left side. Both plantar responses were extensor. Ankle-clonus was not elicited. Sensory changes were marked. A band of hyperæsthesia encircled the waist at the level of the eighth thoracic segment. Sensation to pain, heat, and cold was diminished in the right leg, and delayed in the left leg. There was gross impairment of sense of position in the left foot, but none in the right. The Wassermann reaction in the blood and cerebro-spinal fluid was negative. The cerebro-spinal fluid obtained by lumbar puncture was

clear, not under pressure, and contained an excess of protein and 65 small lymphocytes per c.mm. X ray examination of the spine revealed no abnormality.

Whilst in hospital she became progressively worse, and on March 3rd, 1927, developed retention of urine, which was relieved by catheterisation. On March 5th radiological examination after the injection of 2 c.cm. of lipiodol into the cisterna magna demonstrated the fluid passing down to the level of the eighth thoracic segment, where it was delayed for half an hour; afterwards the lipiodol stream was seen to deviate to the right and to pass down unobstructed to the sacral region (see Fig. 5).

On March 9th laminectomy was performed by Mr. A. J. Walton. On opening the dura a well-defined firm swelling was exposed at the level of the eighth thoracic segment, loosely attached to the leptomeninges and dura on the left side and posterolateral in position. Between the tumour and the dura was a definite bony plaque. The cord itself was flattened and pushed to the right. The general features of the tumour are illustrated in Fig. 3. The patient made a steady and uninterrupted recovery, and within six weeks was able to walk a distance of ten yards without support. She was last seen in November, 1928, when she stated that she was in charge of a large boarding establishment and that, in spite of working hard, she never felt wearied or tired. She was able to walk six miles with ease. She presented no abnormal physical signs. There were no sensory changes or motor weakness, and the deep tendon reflexes were present and equal. The abdominal reflexes over a very lax abdominal wall were not elicited. The plantar response was flexor on both sides. Since recovery from the operation there had been no urinary symptoms.

The specimen removed at operation was examined by Prof. Turnbull, who made the following report:—

Macroscopic Examination.—The specimen (S.D. 485, 1927) was ovoid and measured 2·2 × 1·5 × 0·8 cm. The outer surface was rough, faintly lobulated, greyish-pink flecked with a few dark red areas, and soft, except over an area (1·5 × 1 cm.) where it was smooth, yellowish, and hard. The cut surface was granular, greyish-pink flecked with red, and soft, except beneath the smooth area. Here there was a small triangular portion of cancellous bone (0·4 cm. long), with its apex directed inwards.

Microscopic Examination.—Two portions were fixed in 2 per cent. saline formaldehyde; one portion, which included the bone, being subsequently decalcified in nitric acid. Paraffin section were treated as in the previous two cases, and also by Kossa's method.

The tumour resembles that in Case 2 so closely that it is only necessary to describe the points of difference. Veins and arterioles are more numerous, and there are a few areas of recent hæmorrhage. Hyaline collagenous cylinders, evidently derived from blood-vessels, are much more numerous. Most of these contain a central core of calcium, which in cross-section usually shows concentric lamination. The outer surface is ragged and broken, except in one small area where it is covered by a thick membrane composed of collagenous laminæ, each covered by elastic fibres. Definitely within this membrane is a small portion of lamellar bone containing a Haversian space and two Haversian canals. Several of the elastic sheets in the membrane are continued into the bone. Immediately beneath the membrane, and covered laterally and inferiorly by a narrow layer of collagenous and elastic fibres, is a small triangular portion of bone containing many lamellar systems. It contains a few Haversian canals and several large spaces, which contain wide capillaries in a loose-meshed fibrillar, partly fatty marrow.

The bone appears to have developed within the inner part of the dural theca. The tumour is an endothelioma of the meninges attached to the inner surface of the dural theca. It is an extensively cylindromatous and psammomatous endothelioma of the dura.

Diagnosis.

No hard-and-fast rules can be formulated and applied to the diagnosis of leptomeningeoma of the spinal cord. The nature and character of the symptoms and the subsequent course of the disease cannot be accurately separated into definite stages or periods. The symptoms and the physical signs elicited in any particular case must depend on: first, the site of the tumour; secondly, its rate of growth; and, thirdly, the extent of the injury to the spinal cord produced by the growing neoplasm. Subdivision into the three stages of: (1) root pain, (2) Brown-Séquard syndrome, and (3) complete paraplegia with incontinence of urine and fæces, must consequently be regarded as artificial, and can be of no real value in the study of the condition. Before recourse is made to special methods and aid a study should be made of the clinical features available. In surveying these, certain of the features presented by the three cases reported here will be emphasised.

Level of the Lesion.—Learmonth,[1] in an exhaustive study of 60 cases, found that 63·4 per cent. of leptomeningeomas of the spinal cord occurred in the dorsal region. The tumours in the three cases reported here also occurred in the dorsal region of the cord, one in the upper and two in the lower segment.

Age-incidence.—The condition appears to be more prevalent during the middle and later decades of life. The ages of the cases considered here were 50, 48, and 56. Learmouth found that 48 out of 60 occurred between the ages of 30 and 60.

Sex-incidence.—All three cases were females. The literature also discloses a tendency for the condition to affect the female sex. In Learmonth's series 66·7 per cent. were females. Frazier [2] collected a series of similar growths and found that out of 37 cases 26 were females.

Symptomatology.

Pain is the commonest presenting symptom, but should the tumour be situated anteriorly this may be absent or less pronounced than where the tumour is placed posteriorly or in a postero-lateral position. Bennett [3] has recently placed on record four examples demonstrating the variability of the pain, the cases presenting symptoms that suggested osseous, muscular and ligamentous changes rather than any pathological lesion of the central nervous system. As illustrated by the three cases under review, the pain may be of three types:—

1. *Localised Pain.*—Here the pain, accentuated on movement and accompanied by marked localised tenderness over the spinous process, is situated over the vertebra which is innervated by the segment opposite which the tumour arises and produces its irritating effects. Its presence, therefore, must be regarded as a valuable and important symptom, since it may not only be the earliest indication of a lesion of the cord but may also accurately demonstrate its level. This symptom was a prominent feature in Case 1 and led to the provisional diagnosis of myositis or neuritis. The X ray examination still further obscured the true nature of the condition by revealing the presence of osteo-arthritis of the spine.

2. *Radiating Pain.*—This originates from the pressure of the tumour on the posterior roots; it may be dull and aching but is sometimes described as sharp, shooting, or stabbing, and radiates round the corresponding side of the body. Here also the pain is usually accentuated on sudden movement, and again proves a valuable aid in localising the level of the lesion. It appeared as a prominent symptom in Case 3, although paræsthesia had been present for one month before its onset. A zone of hyperæsthesia may be a manifestation of pressure upon posterior roots and may also indicate the level of the lesion.

3. *Removed Pain.*—This is manifested by the presence of cramp-like pain, frequently accompanied by spasms, in the homolateral lower limb and associated with some degree of numbness and weakness. The explanation of this phenomenon is given by the study of the mechanism of spinal compression by spinal tumours. Purves-Stewart and Riddoch pointed out that the pathological effects of the actual pressure on the cord-elements are very limited and that the widespread interference with cord function is due to vascular changes setting up what they termed a condition of anoxæmia. This engorgement of the spinal veins below the level of the tumour resulting in the depletion of the oxygen-supply to that portion of the cord, probably explains the presence of pain, numbness, and weakness in the lower limbs.

These symptoms, as illustrated by the cases reported here, may be present and persist for many months before the onset of more distressing symptoms.

Weakness and Subjective Sensory Symptoms.—bjective motor disturbance in the form of weakness d stiffness of one limb usually follows other sub-ctive symptoms, but in Case 2 loss of power and iffness in the left lower limb proved to be the esenting symptom. With the further growth of e tumour the conducting tracts on that side of the rd are interrupted, resulting in a progressive ralysis of the muscles supplied by homolateral gments below the level of the lesion, and a loss of nsation to pain and temperature on the contra-teral side. The sense of passive position may be terfered with, but only very rarely is tactile sensi-lity affected. When one half of the spinal cord is terrupted, the clinical picture known as the Brown-quard syndrome may be present. Such a condition, wever, is rarely seen, as a paraplegia soon ensues. "reversed" Brown-Séquard syndrome, where the otor and sensory disturbances are opposite to those scribed above, is seldom met with. The pressure erted by the growing tumour affects the extra-ramidal as well as the pyramidal tracts and a ralysis in flexion results. The spasticity is very arked and the rigidity persists during sleep and, as Cases 1 and 2, spontaneous and painful spasms ay be prominent and frequent. When the state of asticity passes into a condition of flaccidity with sence of superficial and deep reflexes, it is doubtful ether removal of the lesion will lead to a complete covery, permanent damage having taken place in e tissue of the spinal cord.

Vesical Symptoms.—Sphincter trouble had resulted each of the three cases reported here before they me to operation. Learmouth, from a careful alysis of his series, concluded that there was little lation between them and either the level of the mour or its position relative to the cord.

Additional Aids to Diagnosis.

Although the clinical examination, together with e history obtained from the patient, supply the ost important data upon which a diagnosis is based, evertheless valuable confirmatory evidence may be tained from accessory methods.

1. *Examination of the Cellular Content and Chemical roperties of the Cerebro-spinal Fluid.*—It is generally sumed that the cellular content of the cerebro-spinal uid below a spinal block produced by a non-flammatory lesion such as a neoplasm remains altered. Such a finding, however, is inconstant d unreliable. An increase in the cellular content as a marked feature of Case 3.

As a further result of engorgement of the spinal ssels below the site of compression, their perme-bility becomes increased and transudation occurs. he pigment of the altered blood gives the cerebro-inal fluid below the level of the lesion a charac-ristic yellow colour known as xanthochromia. Its esence, however, is not constant, and it was absent the three cases described here. Moreover, it has equently been recorded in other conditions.

The normal protein content of the cerebro-spinal uid is approximately 25 mg. per 100 c.cm. Below e site of spinal compression it may be increased up 2000 mg. per 100 c.cm. This increase in the otein associated with no increase in the cell count as held by Nonne [5] to be strong evidence of the esence of a spinal cord tumour. Similarly, an crease in the glucose and mineral salts may be oted.

The fluid below the site of compression may also ow spontaneous coagulation owing to the presence f fibrinogen. This property, along with the presence f xanthochromia and high protein content, combined ith a normal or but slightly raised cell count, was rst described by Froin,[6] and these signs are collec-vely designated the "loculation syndrome."

Finally, as pointed out by Purves-Stewart and iddoch, fluid in an isolated sac of the spinal rachnoid space is separated from the source of any rments passed into the space from the choroid lexus and the pituitary body.

2. *Study of the Combined Cisternal and Lumbar Puncture.*—Normally the composition of the fluid should be constant throughout the subarachnoid space. When a spinal subarachnoid block is established, the composition becomes altered in the way described above. Ayer [7] elaborated a method by which the fluid above and below the lesion can be studied. Needles connected to manometers are introduced into the cisterna magna and the lumbar region of the space with the patient lying on his side. Stookey [8] and others, following their study of manometric readings in 50 suspected cases of spinal cord tumour, stated that combined lumbar and cistern puncture is indicated when manometric studies from the lumbar puncture alone do not permit of definite conclusions, and that in their series the combined method was only necessary in three instances.

3. *Manometric Studies of Cerebro-spinal Fluid through Lumbar Puncture.*—In 1916 Queckenstedt,[9] by means of lumbar puncture alone, demonstrated that the pressure in the subarachnoid space was raised after compression of the jugular veins in the absence of spinal block, but that when obstruction was present the response to the general methods of raising the general pressure in the space was altered, lessened, or absent. Stookey has emphasised the value of this method in the investigation of spinal cord tumours, and considers the examination incomplete if a manometric study has not been conducted.

4. *Injection of Lipiodol into the Spinal Theca.*—This method of investigation, first introduced by Sicard and Forestier,[10] has provided us with a further valuable aid in the study of spinal cord compression but, as recently emphasised by Armour,[11] its use should in no way usurp the place of careful and repeated systematic clinical examinations of the patient.

With the patient sitting upright, 2 c.cm. of lipiodol are injected into the cisterna magna. In the absence of a block the fluid falls to the lower end of the spinal theca in two to seven minutes. When the offending lesion has established a subarachnoid block, the lipiodol may be completely arrested above the site of the tumour for a long time, and later commences to trickle down to the lumbo-sacral portion of the sac. Figs. 4 and 5 illustrate the results obtained in the investigation of Cases 2 and 3 by this method. The value of lipiodol is greatest when the level of its arrest corresponds with the level of the tumour, as determined clinically by sensory changes. In addition, the outline of the lower border of the shadow of the arrested fluid may suggest the nature of the tumour. Thus in a case of extramedullary compression the lower end of the shadow may taper to a thin point where the lipiodol slowly trickles through (Figs. 4 and 5), whereas in cases of intramedullary growths the lower border of the arrested fluid assumes a more uniform outline, which tends to be crescentic with its concavity downwards (Fig. 6).

The injection can also be made into the lower end of the spinal theca by lumbar puncture. This method is simple and free from the risks entailed in cisternal injection, but it requires a special table and has a further disadvantage in that many patients cannot tolerate the reclining position which is necessitated by the test for a period of 10 to 20 minutes.

The use of "light lipiodol" has not gained universal favour, and it possesses no great advantages over the methods already described.

Various complications have been attributed to the use of lipiodol in the investigation of spinal compression from extramedullary tumours. After the injection in Case 2 the symptoms became rapidly worse and complete paralysis of both lower limbs, together with incontinence of both urine and fæces, ensued. Lipiodol, therefore, should not be used unless the patient can be operated on soon after, should necessity arise.

When such conditions as meningovascular syphilis, intramedullary neoplasm, and syringomyelia, together with pathological changes in the vertebræ have been excluded, and recourse to the special methods defined above has established the diagnosis of lepto-meningeoma of the spinal cord, the condition becomes

a surgical emergency and operative procedure should be adopted immediately. If operation is unduly delayed permanent degenerative changes may occur and lead to irrecoverable damage to the conducting fibres within the cord.

I am indebted to Prof. Hubert M. Turnbull and Mr. A. J. Walton for their help in elucidating my cases.

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METHODS OF TRACHEAL INSUFFLATION

AND INTUBATION INHALATION OF ANÆSTHETICS.

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When Meltzer and Auer experimented upon animals in 1909 the advantages claimed by them for the method of tracheal insufflation were, first and foremost, that it was a safety method which would prevent the inhalation of fluid or foreign substances into the air passages; and, secondly, that an animal could be kept alive for a prolonged period when both pleuræ were opened, thus proving it to be a very efficient means of performing artificial respiration.

Complete and Partial Insufflation.

How far, in actual present-day practice, this is a safety method is a subject for serious examination. I propose to advocate strongly the adoption of a modified terminology, which is essential if students and others who take up this method are to be made aware of the very important differing conditions which exist in what I shall refer to as complete tracheal insufflation and partial tracheal insufflation. Complete tracheal insufflation means the passage of air or gas and oxygen into the trachea in such quantity that the patient's tidal capacity is more than satisfied, and that even during the inspiratory phase there is an outgoing current through the glottis. This is the Meltzer-Auer method and is the only one to which the term "safety" can correctly be applied, for if these conditions are not fulfilled and the patient can, during inspiration, draw air through the glottis, fluid may certainly be aspirated with it. Partial tracheal insufflation implies that an amount of air or gas and oxygen less in volume than the tidal capacity is passed in, allowing the patient to make up the deficiency by a to-and-fro movement of air through the glottis. Unaided, this is not a perfectly safe method; the same precautions against the aspiration of fluid must be taken as in an ordinary administration, and provision must be made to counteract any tendency to obstruction by the base of the tongue, or by any other impediment to a free airway. The patient is, in fact, at a disadvantage, because the normal protective reflex mechanism against inhalation of fluid or solid particles, present during light anæsthesia, is hampered by the presence of the catheter between the cords, and the epiglottis is out of action. Coughing consists of violent expiratory efforts followed by a long-drawn and equally violent inspiration, and it is at this moment that aspiration is most likely to occur. When once movement is set up in the larynx the catheter acts as a strong irritant until the reflex can be abolished. Partial insufflation is the method commonly in use, and its imperfect protection against inhalation has unfortunately been demonstrated in practice.

The tidal capacity is that amount of air which passes in and out of the chest during respiration. It corresponds with the difference in cubic content of the respiratory air-space between the range of expansion and contraction of the chest. It is indicated by the movement of a bag of gas or air when the face-mask is closely applied. It varies within wide limits, both in the same and in different subjects under varying conditions. It usually decreases in amount as the rate of breathing increases, and vice versa. The average amount of the tidal capacity is given in text-books as 500 c.cm., but it is sometimes very much more or, with quiet breathing and small chest capacity, much less. The rate of respiration during anæsthesia under favourable conditions may be little above the normal, but frequencies of 30 or more are met with. To calculate in litres per minute the rate of flow necessary for complete insufflation the tidal capacity must be multiplied by the frequency of respiration per minute, and the quotient must then be doubled, because the flow is continuous during the expiration phase and an excess must be provided for.

It is sufficient for my purpose to show that a very large flow may be required and that few, if any, of the small air pumps now in use are capable of putting up such a performance. A large foot-bellows will give an adequate flow, and it is noteworthy that this is actually a very good instrument to use, for with it a perfect artificial respiration may be maintained increasing pressure and flow during inspiration and decreasing during expiration. An anæsthetist's equipment should provide for maximum requirements and a good mechanical pump should be able to generate a large volume of air at low pressure.

The Size of the Catheter.

It is impossible at low pressure to pass a large volume of air through a catheter with a small bore and if the external dimension is too great it will act as a block against the return flow. The theoretical ideal is that the bore of the catheter should be a little less than the surrounding space in the trachea, so that a large volume of air can pass in at low pressure and return with equal freedom, allowing normal chest movements and the variation in cubic content which they involve. It is important to realise that the manometer indicates the pressure inside the catheter, and that this corresponds to that in the lungs only when there is a block against the return, or when the ingoing channel equals the outgoing. When the catheter bore is small in comparison with the surrounding space the manometer reading will tend to be higher than the actual pressure in the trachea, unless a block is put on the return.

Practical Applications.

Complete insufflation, although protective against inhalation dangers, is of little use in operations on the mouth which involve bleeding, on account of the impossible situation set up by the projection of blood and anæsthetic vapour in the face of the operator. It may be used in ordinary work, but only at very low pressure, or with variation in pressure corresponding to the respiratory phases. Low pressure complete insufflation requires an exact choice of catheters. Its real practical importance is that it should always be possible to convert a partial into a complete insufflation if fluid is ejected into the throat. Thus only will the patient be secure against aspiration until the pharynx can be cleared. It follows that in mouth operations some other method is essential, and the one commonly employed is the double catheter and pharyngeal pack or the single intubation inhalation method. When the double catheter is used the second, or exhaust

must be as large as possible, and the inlet catheter will on this account be smaller than it would be in the case of an ideal single catheter administration. The insufflation will, therefore, almost certainly be partial, and to-and-fro breathing will take place through the exhaust. In fact, all variation in chest capacity must necessarily take place through its channel. Now the largest possible lumen in these circumstances can only be but a poor airway compared with the normal, and the use of double catheters can only be looked on as a compromise necessitated by the circumstances of the operation, and in no way desirable, or superior to, the single catheter in ordinary cases. They are necessary whenever the anæsthetist has not complete control over the conditions prevailing in the upper air passages, or in a partial insufflation saliva can always be aspirated if the position of the head is favourable, and a mouth airway by no means provides a channel for breathing in all circumstances.

In the alternative method of intubation inhalation a large single tube is passed into the trachea and the pharynx is packed round it. The patient breathes through its lumen, and anæsthetic vapour is added to the ingoing tidal air by means of an adaptor on the end of the catheter. This is also a compromise and, unless the bore is large, the airway is obviously restricted compared with the normal. The frictional resistance to the passage of air through small tubes is considerable, and imposes effort on the patient. Signs of anoxæmia may develop, and it is always useful in this method to add oxygen to the ingoing air. Slow, deep breathing indicates high carbon dioxide tension. If anyone doubts the exertion involved in breathing through small tubes, let them make a personal experiment.

Now although, when the pharynx is packed, the patient is safe in respect to fluid from above, it must be remembered that fluid may be ejected from the stomach below the pack and be dammed in the neighbourhood of the glottis. It is essential, therefore, to maintain an even depth of anæsthesia and, if vomiting should threaten, the anæsthetist must be alert to deal with it.

Tracheal insufflation of gas and oxygen is a common procedure. It is evident that only with complete insufflation is it possible to maintain anæsthesia; for how, if the patient is breathing air as well, could such a mixture be effective? The large amount of mixed gases required for a complete insufflation makes this method unpractical. It follows that most of these administrations are partial, with the addition of ether, and if the gases are led through an ether bottle the procedure is practically an ether administration, using gas and oxygen as a vehicle.

Partial insufflation of gas and oxygen can be made practical by the use of a rebreathing bag, and this is a good method. Meltzer and Auer's second discovery is applied in intrathoracic surgery. Before closing the chest the lung has to be expanded so that it will fill the pleural cavity. The negative pressure in the pleura at full inspiration is given as 30 mm. of mercury, and the safety-valve is set to blow off at this pressure. If the catheter has been correctly chosen the lung may be expanded and held by a complete insufflation at this pressure without any interference with the return flow, but if, when the manometer shows this pressure the lung fails to expand, it shows that the catheter is too small, and a block must be put on the return flow. This may be done by applying an ordinary rubber face-mask, of which the aperture is occluded by a suitable metal fitting carrying a tap. This tap can be adjusted so that air may be continuously passed, while sufficient is retained in the lungs to distend them. Pressure on the lungs cannot be maintained for more than a short period. With the fixed chest alveolar ventilation depends entirely on diffusion and is inadequate. The alveolar capillary pressure will be very much lower than the air pressure; that in the large veins is normally only a few millimetres of mercury and, during inspiration, it tends to be negative. High pressure interferes with the circulation, and the venous return to the right auricle is impeded. This results in decreased output by the left ventricle, and the pulse becomes small. On releasing the pressure the pulse regains its former volume. This may be demonstrated on any case. High pressure insufflation is on this account bad practice, and is to be used only as occasion demands, and then only for a short period.

Occurrence of Apnœa.

It is frequently stated that apnœa is commonly produced by this method. Physiological apnœa is that condition in which, owing to excessive alveolar ventilation, the tension of carbon dioxide in the blood falls so low that it fails to excite the respiratory centre. There is another cause of stoppage of the breathing, for the centre may be rendered inexcitable to a normal amount of carbon dioxide, and this can be done very easily by drugs such as morphia, ether, and chloroform. This stoppage can be produced any time by ether and is sometimes seen when a patient has been difficult to relax and ether has been liberally used. When relaxation is attained the breathing ceases, or almost ceases. If ether is lessened or discontinued and insufflation of air increased the breathing will gradually be resumed at normal depth, thus demonstrating the cause of the stoppage. Tracheal ventilation in the absence of exaggerated chest movements does not lead to excessive alveolar ventilation. The characteristic features of this method are quiet breathing and the perfect colour of the patient. Normal breathing and good colour indicate that carbon dioxide tension is normal and that the depth of respiration is sufficient to carry oxygen to the alveolar air. There is, therefore, in ordinary circumstances no reason why true apnœa should occur, and I certainly have never been troubled by it. Any stoppage which can be treated by continued insufflation is certainly due to high ether tension and not to deficiency of carbon dioxide. It is possible that the Hering-Breuer reflex may contribute to a temporary hold-up in respiration, especially at the early stage mentioned above. Distension of the alveolar wall reflexly inhibits inspiration through the vagus. This condition is not an apnœa, but a prolonged respiratory effort in one phase.

Warming the Air.

The question of warming the air is, I hope, now settled. Patients receive the air at about room temperature, and this is what they require. It is odd that the most important consideration is generally overlooked; when air is insufflated it impinges on the moist surfaces of the air passages, and unless it is saturated with water vapour evaporation from the moist surface is inevitable. Heat is absorbed in the process of evaporation and is extracted from the surface. This is why the pharynx sometimes feels cold and the tongue may get dry. The cooling is proportional to the volume and rate of flow of the air current. It is the strongest argument which can be brought forward against large volume insufflation. If it is to be avoided the air must be moistened rather than heated. Fortunately, many thousands of administrations by many anæsthetists tend to show that there is no method more free from respiratory troubles than the one under consideration. If anyone is in doubt whether an administration is complete or partial, let a small flake of cotton-wool be placed in the pharynx or at the mouth of the airway, and this will show which way the wind blows.

A HOSPITAL'S COFFEE TAVERN.—Some years ago the London Midland and Scottish Railway presented the Euston Coffee Tavern at Crewe for the benefit of the Crewe Memorial Hospital. The tavern, which is managed by a committee of the hospital staff, has handed over £500 as the profits of the past year. Several thousands of pounds have now been paid to the hospital from this source.

A NOTE ON THE FREQUENCY OF SKI-ING ACCIDENTS.

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THERE recently appeared in *Punch* a humorous drawing designed to call attention to the frequency of injuries due to winter sports, especially ski-running. It may therefore be of interest to your readers to know what this frequency is in fact, and the following note sets out our experience at the winter resort of Arosa in the Swiss Alps, the data being complete up to the end of January, 1929.

The first communications on ski-ing injuries were made by Steinmann 1911, Oberst 1911, and Bernhard (St. Moritz) 1913. Then followed v. Saar, Mandl, Staehelin, Likint, Drevermann, Genewein, and Hug (references given at the end). Most of these simply narrate cases. Only Hug put together some figures on frequency, using material not observed by himself, but collected from ten insurance companies. I have had opportunity within the last six winter seasons in Arosa of observing personally 430 injuries occurring during ski-running. In addition, I have sent round a questionary for 1927–28 addressed to the ski-ing instructors to ascertain how many accidents occurred during practice and on conducted tours; these results have been published (reference at end).

Causative Factors.

From this material the salient facts are as follows. The kind and frequency of injuries to ski-runners undoubtedly depend on the degree in which they have mastered ski-ing, in other words, on good technique. Medical experience in general as well as the replies to the questionary addressed to instructors show that poor runners run a greater risk than middling runners, and middling runners a greater risk than really good runners. This observation conflicts with the conclusions drawn by Hug from material supplied by the accident insurance companies, according to which the expert runs an increased risk of accident. The discrepancy arises from the fact that instructors and guides make a rule of insuring, while only some 10 per cent. of the other members of the Swiss Ski Club are insured against accident. For the rest the good runners in consequence of their knowledge of the country and of weather conditions, together with their experience in the various kinds of snow get out of difficult situations without injury more easily than those with less judgment and experience. The risk of accident therefore steadily diminishes in proportion to the mastery of technique.

Apart from technique there are other circumstances which affect the frequency of accidents. One is imperfect visibility, especially in early morning and late evening, but also in dazzling sunlight, which makes it impossible for the runner to orientate himself even at a short distance. Then only very careful running can help him along with observance of every precautionary measure. In point of fact a disproportionate number of accidents are due to such circumstances. Another important factor is variation in the quality of the snow. It often happens that the runner suddenly passes from a crusted surface into deep powdery snow, and if his technique is not up to meeting the new conditions at once and correctly a fall is inevitable, although even then a fall rarely leads to accident. Furthermore, the precise way in which the fall happens is very important for the resulting injury; he who understands how to fall will run much less risk, even in severe falls, than he who does not understand. Masters in this art are not the grown-ups, but the children, who simply let themselves fall without making any effort to prevent it. This counts for much on a hard surface, which takes first place in responsibility for various forms of injury. For example, the torsion fractures of the metacarpal bones, described as very frequent in Central Switzerland from a fall on the hand which still holds the stick, only occur with us under quite definite conditions—namely, when for long no snow has fallen, when the slopes have become very hard, and when the tracks are iced. Then elderly runners whose technique is not very good are specially liable to incur severe injuries, particularly fractures and sprains in the region of the upper limbs.

The Common Injuries.

The large majority of all ski-ing injuries, of course, concern the lower limbs. Here, again, there is a definite correlation with changing snow conditions; when there is deep powdery snow sprains and tears of ligaments in the knee and ankle-joints predominate, whilst on a hard surface fractures of one or both legs occur much more frequently. The commonest leg injury is the torsion fracture of the fibula at its lower end. Supination fractures of the outer ankle occur, the method of production being typical and generally the result of the Christiania swing. Torsions occur more frequently in stemming and Telemark turning. In this connexion it may be mentioned the interesting fact that the injury often precedes the fall. The fall therefore is not its consequence but its cause. In a great number of these cases it is torsion of the body on a leg which is more or less fixed by the ski-binding or by the snow that is the immediate cause of the injury; a fact which is well illustrated by the case of a runner who, when lying on a slope where he was held fast, produced a torsion fracture of his fibula by a smart turn of his body.

Some difference occurs as between the sexes, inasmuch as the frequency of knee distorsion, which consists essentially in a tear (seldom in a complete separation) of the collateral tibial ligament with consequent marked abduction of the leg, largely preponderates in women—48·0 per cent. compared with 19·7 per cent. in men. On the other hand, the ankles were damaged among men in the proportion of 54·2 per cent. to 34·5 in women. The different relation of the axes of the thigh and leg, which allows in the woman much severer loading of the knee in the direction of genu valgum, may be regarded as the reason for his difference.

Prophylaxis.

On an analysis of the whole material 10·4 per cent. of all injuries concern the head and trunk, 14·8 per cent. the upper limbs, the whole of the remaining 74·8 per cent. falling on the lower extremities. Accidents attributable to equipment itself, skis, or sticks, are very uncommon with us because the favourable snow conditions do not give occasion for them. Yet I have among my material a small number of contusions from falling on the points of the ski and some stabs and contusions due to sticks. The great majority of all injuries occurred during the downhill run from disturbance of coördinated movement between the ski and the body, with resulting disturbance of equilibrium. The form and tightness of the binding certainly is a contributing factor, although in the absence of good material for comparison it would be impossible as yet to say whether this or that binding is more favourable for the avoidance of injuries in falling. Much weight is certainly to be laid on equipment. Bad equipment produces a greater tendency to fall, and frequent falls lead to local and general fatigue which results in a greater risk of accident. This must also be considered in the choice of participants for a tour, for when a man with little technical experience makes a considerable tour with good runners he incurs much more risk than if all the runners are about equally good. The poor runner will already be unduly tired by the speed of the initial climb, and therefore runs increased danger of fatigue and fall on the descent. Most accidents happen in fact to people who have set themselves too difficult a task and have undertaken tours of which they were not yet capable.

That good runners incur a very small risk is also ıe experience of our Swiss ski-running competitions hich I have medically inspected since 1920, during hich time I have seen at least 1000 long-distance ›mpetitors and some 1300 military patrols. Among ıem not a single severe accident occurred in spite the severe demands made on them and the unfavour›le conditions of snow and course. This is also ›nfirmed from the sporting side by Erb as ski-ing acher and instructor of a Swiss mountain brigade.

The practical deduction from all this is that we ıould so develop our ski-ing technique that we can ›nture even on long and difficult tours with diminished sk of danger. The equipment must be carefully seen before every such tour. Difficult tours should ways be made with a guide, and due consideration ould be given to the experience of mountaineering, hich has in England especially such prominent lvocates. The risk of accident will then be brought ›wn to a very low level, as may be seen from the atistics of ski-instructors already mentioned, who ıly had seven accidents in 6000 lessons, say 1·2 per ›nt., an almost negligible figure. Of these, six ›curred to poor runners, only one to a good runner. n tours in the same period 1900 persons were ›nducted, of whom nine suffered injury—one of ıese was a good runner, one a middling runner, and ıe remainder were poor runners. These figures ustrate clearly the conditions which lead to increased sk on the part of poor runners, but they show also ıat reasonably conducted ski-ing carries with it no rticularly high risk of injury. Anyone who is raid of a possible accident is no sportsman; anyone who provokes an accident by negligence is also at heart no sportsman.

The figures given above are valid for Arosa as a type of Swiss winter-sport resort. They are naturally not to be transferred without adjustment to other climates and other types of hilly country, but must be assessed elsewhere with due regard to local conditions. It would be very desirable to obtain without delay from other resorts similar collections of the largest possible material. For the Swiss high alps the acts may be considered closed.

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Clinical and Laboratory Notes.

NOTE ON METHOD OF RECORDING THE PHYSICAL SIGNS IN RHEUMATIC CARDITIS.

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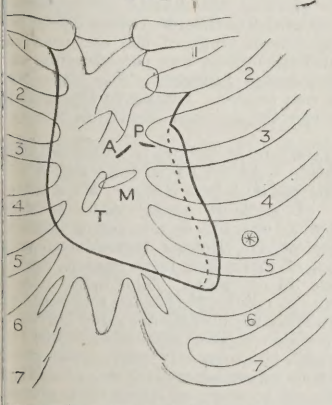
IN the institutional treatment of pulmonary ıberculosis it has long been the custom to record ıe pulmonary physical signs by diagrammatic ıethods, whereby they can easily be understood by medical men. The method allows one medical man to appreciate the signs found by another, and also provides for a series of diagrammatic representations of those signs at regular intervals of time, so that at the end of the series a fairly accurate idea of their progress can be obtained.

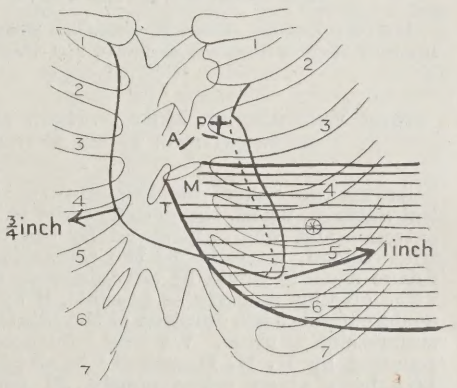
FIG. 1.



mpression of the rubber stamp on which the physical signs are recorded.

Rheumatic heart disease is likely to come more and more under institutional treatment during the next few years, and some similar diagrammatic method f recording cardiac physical signs will probably ecome desirable. While working in a small ard at St. Mary's Home, Broadstairs—a ward evoted mainly to treatment of rheumatic disease ı childhood—I became most dissatisfied with the methods I had of keeping a serial record of cardiac physical signs in any child, and I therefore adopted a diagrammatic method. Messrs. E. M. Richford, 40, Cheapside, London, E.C., constructed for me a rubber stamp the impression of which is shown in Fig. 1. This impression, adapted from a diagram in Cunningham's "Manual of Anatomy," enables me to record the physical signs given by the rheumatic heart from month to month, together with brief accompanying notes on special symptoms and signs, such as pallor, tonsillitis, or sinus arrhythmia.

FIG. 2.

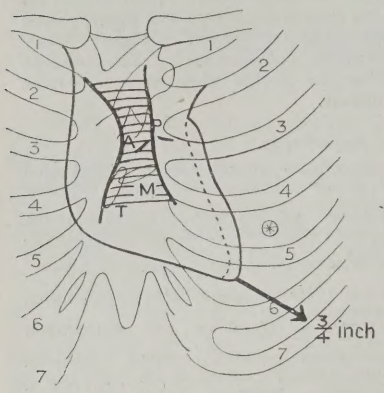


Mitral regurgitation; the murmur is conducted to the axilla. Apex-beat 1 inch displaced to the left and in the fifth intercostal space. Right border of heart ¾ inch dilated. Pulmonary second sound accentuated.

The three accompanying diagrams illustrate my method, which has saved me much time and uncertainty in my estimate of clinical progress. (Figs. 2, 3, and 4.) The left nipple and the right sternal margin being shown, it is a simple matter to indicate the the positions of the heart-borders by arrows with the number of inches of dilatation attached to them; the position of the apex-beat is similarly shown in the proper left intercostal space. Abnormal auscultatory signs may be mapped out, regurgitant murmurs, whether mitral or aortic, being horizontally shaded and obstructive bruits vertically shaded; the areas shaded correspond with the areas of audibility. An accentuated sound is marked by the sign +. Diastolic mitral murmurs—variations in which are of such

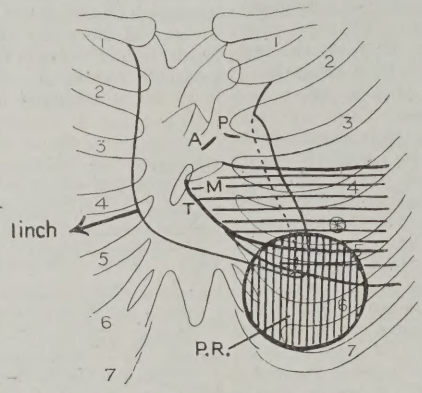
especial prognostic significance in relation to mitral stenosis in later life—vary so much in their time-relation and also with the posture of the patient (especially after exertion) that I append to the marking of the murmur letters that denote whether the murmur is heard early in diastole (E), in mid-diastole (M), or as a presystolic bruit (P), and whether heard at the area indicated in the left lateral position only after physical exertion. Finally, I include (Fig. 5) an example of notes summarising a periodical examination in a complex case.

FIG. 3.



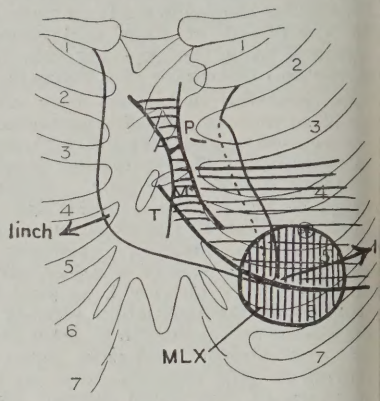
Aortic regurgitation; murmur conducted as shown. Apex-beat in sixth space (hypertrophy of left ventricle) and ¾ inch to left of nipple line.

FIG. 4.



Mitral regurgitation. Mitral obstruction. P.R. indicates a presystolic bruit heard in the supine position. Right border of heart 1 inch displaced to right of right sternal margin.

FIG. 5.



Summary of periodical examination in a complex case: No pallor; tonsils large and ragged; no chorea; evening temp. 98·4° F.; pulse 96; slight sinus arrhythmia; up for two hours daily.

NOTE ON THE USE OF INTRAVENOUS SODIUM BICARBONATE SOLUTION IN THE TREATMENT OF BLACKWATER FEVER.

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AFTER the case of blackwater fever[1] we reported last autumn, where the patient came into hospital in extremis and was only saved by the transfusion of whole blood, we came to the conclusion that in all future cases it would be advantageous to render the urine alkaline as early as possible, if by so doing we could cut short the duration of the attack and obviate suppression of urine. We were influenced by the case reported by H. M. Hanschell[2] in which the patient had been given intravenously 20 oz. of sodium bicarbonate solution (strength grs. 150 to the pint), within one hour of being seen by the doctor with the result that the impending suppression of urine was prevented, diuresis promoted, and the attack apparently curtailed. The work of S. L. Baker and E. C. Dodds[3] supports this method of treatment in all cases of hæmoglobinuria. They state that:—

"It (the treatment) should be such as will reduce the factors leading to precipitation of the pigment in the kidney tubules; these factors are seen to be acidity and salt concentration of the urine. Alkaline diuretics or transfusion of sodium bicarbonate solution as soon as possible should tend to minimise the hæmoglobin precipitation of the tubules."

We have recently had two cases of blackwater fever in which we were able to try this method. The histories are briefly as follows:—

CASE 1.—European male, aged 56, had been in Kenya Colony for 30 years and had had four previous attacks of blackwater fever, the first in 1900 and the last in 1919. He gave a history of frequent attacks of subtertian malaria in the past, but more recently had had no definite attacks of fever. He was an irregular quinine taker. The day before admission to the Hospital for Tropical Diseases he had felt "off colour." Suspecting himself to be suffering from an attack of malaria he took quinine grs. x. at 10 A.M. and grs. 5 at noon on the succeeding day (day of admission). After the second dose of quinine he passed dark-coloured urine, was slightly jaundiced, and perspired freely. Recognising the condition the patient sent for a doctor, who ordered his immediate removal to hospital. When he was admitted at 7 P.M. his temperature was 101° F., his pulse-rate 110, and his respiration-rate 20. A blood count was immediately taken and he was found to have 4,800,000 red cells, 6000 white cells, and a hæmoglobin percentage of 85. No parasites were seen, nor was there any evidence of corpuscular degeneration. His urine had a specific gravity of 1008, and a faintly acid reaction; it contained a quantity of albumin and scanty red amorphous casts, but no erythrocytes. The spectroscope showed the bands of oxyhæmoglobin. The patient complained of intense thirst, had a dry and coated tongue, and an icteric tinge of the conjunctivæ, face, limbs, and trunk, and his spleen was palpable one and a half inches below the costal margin. The liver was enlarged downwards and was tender. Owing to the prompt action of his medical adviser the general condition was fair on admission.

It was decided to give sodium bicarbonate solution intravenously as soon as possible. At 8.30 P.M. (one and a half hours after admission) the patient had a rigor, after which he was given 10 oz. of sodium bicarbonate solution followed immediately by 8 oz. of 5 per cent. glucose solution. Sleep then followed. Before transfusion with sodium bicarbonate 17 oz. of urine had been passed, and in the eight succeeding hours 36 oz. more. The urine passed after transfusion was deeper in colour, this being undoubtedly due to the rigor and hæmolysis which had occurred earlier in the evening. Twenty-four hours later, the urine being still very dark in colour although the quantity passed was good, intravenous transfusion was repeated with 7 oz. of sodium bicarbonate solution followed by 4 oz. of 5 per cent. glucose solution. The total urine passed in the 24 hours was 56 oz. followed by a further 42 oz. during the next night. After the second transfusion the urine started to clear, although the patient complained of some pain and irritability on micturition, and within 46 hours of the onset the appearance of the urine had become perfectly normal. After the first day the temperature fell to normal and no further pyrexia occurred. Icterus persisted for four days in all, and on the fifth day the spleen was no longer palpable. In spite of the severity of this, the patient's fifth attack, he made an uninterrupted

[1] THE LANCET, 1928, ii., 645.
[2] Trans. Roy. Soc. Trop. Med. and Hyg., 1926, xix., 488.
[3] Brit. Jour. Exper. Path., 1925, vi., 247.

recovery, and his red cells never fell below 4,260,000 per c.mm. with a hæmoglobin percentage of 85. No malarial parasites were ever seen in the blood films during the disease, but, following our routine, the patient was given treatment with plasmoquine compound when he had fully recovered from the attack of blackwater fever. As is usual in these cases, the patient was kept on a fluid diet, with grs. 5 of sodium bicarbonate added to each feed.

CASE 2.—European male aged 28, had returned five weeks previously from Nigeria and was an irregular quinine taker. Feeling feverish and having vomiting, pain in the loins, enlarged spleen, and diarrhœa, he saw a consultant, who diagnosed the case as malaria and sent him to the Hospital for Tropical Diseases. He was admitted that evening, and on examination was markedly icteric, had an enlarged spleen palpable one inch below the costal margin, pain and tenderness over the lumbar region, and a slight rise of temperature. His blood count showed 4,800,000 red cells; hæmoglobin 85 per cent., and 6000 white cells. Scanty subtertian rings were present in the film, but no corpuscular degeneration was observed, and the urine was normal. The condition being recognised as a pre-blackwater stage, the patient was kept strictly to bed and put on a fluid diet with sodium bicarbonate in all feeds.

Next day his condition was greatly improved and plasmoquine compound, one tablet twice daily, was ordered. On the following day, instead of the two grains of quinine contained in the compound plasmoquine tablets, he was given one dose at 6 A.M. of quinine hydrochloride, grs. 5. His general condition had so much improved that this increase appeared to be warranted. At 10 A.M., however, he passed urine dark in colour and at 12.30 P.M. definite blackwater supervened. This urine had a specific gravity of 1012, an acid reaction, and contained much albumin. Scanty red amorphous casts were present. In a blood film taken at this time no parasites and no corpuscular degenerations were seen. The urine showed the bands of oxyhæmoglobin in the spectroscope. As in the previous case, 10 oz. of sodium bicarbonate solution, followed by 4 oz. of 5 per cent. glucose solution, were given intravenously at 4.30 P.M. Immediately after the transfusion the patient had a rigor with a rise of temperature to 105·4° F., but this had fallen to 102° F. by 10 P.M. Again, as in Case 1, the urine subsequently passed was much deeper in colour, and reached its deepest tint by midnight when it was, however, strongly alkaline in reaction. As the patient was vomiting persistently rectal salines with glucose were given six-hourly, and tinct. iodi. ℥ i. doses by mouth and gr. 1/6 of morphia hypodermically were also given.

Next day the temperature was still 100°–102° F. and vomiting persisted. The kidneys were, however, functioning well and 69 oz. of urine were passed in the 24 hours. On the following day the temperature fell to normal at noon, jaundice was less marked, vomiting had ceased since 2 A.M., and at 4 P.M. the urine passed was quite clear, exactly 51½ hours after the onset of the blackwater. Plasmoquine compound was resumed later in small doses and the patient made an uninterrupted recovery.

The blood count in this case fell as low as 2,100,000 red cells with a hæmoglobin percentage of 50 at the time of cessation of the blackwater, but rapidly regenerated and was normal three weeks later. The spleen was no longer palpable three days after the attack began.

Comments.

1. Both cases were negative to tests for paroxysmal hæmoglobinuria.

2. As both patients were of continental nationality and accustomed to alcohol, champagne was given daily in small quantities without adverse effects.

3. Case 1 had two intravenous transfusions, and even though he was an older man and had had in addition the shaking and disturbance of an ambulance journey at the height of the attack, his urine cleared more rapidly than did that of Case 2, and he did not have such severe hæmolysis. In his case the second transfusion, indicated on account of the subnormal temperature and lack of appreciable improvement in the urine, may have been the determining factor in obviating the persistence of the hæmolytic process. In Case 2 the urine took longer to clear and there was a more severe hæmolysis, but only one transfusion was given. The second transfusion was withheld, as the temperature was approaching normal and rectal salines were being well retained.

4. Both cases gave a negative result to the Wassermann test, and there were no signs of any intercurrent disease.

5. Judging from the results of these two cases it appears that immediate transfusion with sodium bicarbonate solution is indicated in all cases of blackwater fever to curtail the duration of the attack, to prevent blockage of the kidney tubules, and to avoid suppression of urine.

6. More than one transfusion may be needed and should be given when there is no appreciable improvement within the first 24 hours. The need for further transfusions should be judged by the progress of the case.

7. Although rigors and further hæmolyses may occur after transfusion the effect on the urinary system fully justifies the measure, but should signs of anoxæmia appear blood transfusion must be employed instead, and this must be from a donor who is not taking quinine.

In conclusion, our thanks are due to Dr. P. H. Manson-Bahr for permission to publish these cases, and to Dr. H. B. Newham, Dr. P. H. Martin, and Mr. F. W. Foster for carrying out the pathological investigations.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF WAR AND SURGERY.

AT a meeting of these two Sections on Feb. 6th, Sir HOLBURT WARING being in the chair, Group-Captain H. V. WELLS opened a discussion on the importance of

EARLY DIAGNOSIS IN TREATING SPINAL INJURIES.

The diagnosis of serious injury to the spinal column following an aeroplane crash, he said, was a matter of much importance, not only in the Air Force, but to the medical profession generally, especially remembering the increase taking place in civilian flying. The chief difficulty naturally arose in connexion with cases in which obvious signs and symptoms were lacking, where fracture of a vertebral body was not immediately followed by apparent grave involvement of cord or nerves. In so-called "missed cases" it was found that weeks, even months, after a crash, spinal curvature or definite neuritis supervened, and a skiagram taken at this remote date showed what the injury was. At the time of the mishap perhaps all that had been reported was a bruising or a straining of the muscles of the back, the only attention given immediately after the accident having been a few days in bed and some massage. After weeks back at work, the man perhaps reported shooting pains in the back, or an inability to straighten himself painlessly.

He divided these fractures into "upper" and "lower." The former were in the upper flexible part of the spinal column, the latter in the more rigid lower region. Fractures in the upper region were brought about by the spine being forcibly bent upon itself; the head was forced forwards upon the curved upper spine, and the maximum force of compression was most often borne by the second or third dorsal vertebra. The fact of the pilot being secured in the plane by a belt was not now thought to contribute to the injury, as it was sufficiently loose to allow of "play," and was only intended to prevent the man from falling out. Fractures in the lower region were, he said, produced by the weight of head and chest being borne by the lumbar spine at the moment of impact, the power of the impulse being reinforced by the rebound being transmitted through the lower limbs. During the apprehension as to what was going to happen, the legs were braced against the rudder-bar, and so the force of impact at the moment of the accident was concentrated on the lumbar spine. The special type of fracture being discussed was the compression or crush fracture, one involving only the vertebral body. The cancellous tissue suffered

crushing, and apparently the spinal column sprang back after the blow.

The patient merely complained of a stiffness or a pain in the back, and there appeared to be no displacement in the spinal line, the reflexes being normal. Strain of the back muscles was usually diagnosed by the medical officer, and the treatment was directed accordingly. Perhaps examination by X rays was not deemed necessary. Only later, when rarefaction had set in, a yielding of the fractured vertebræ was the extent of the injury disclosed. Obviously the spine should be subjected to X rays in every case of accident to the spine, though admittedly at any early stage examination of such a skiagram it might reveal nothing abnormal. Therefore, reliance must be placed on the history and the presence or absence of pain. The medical officer should ascertain the angle and probable speed at which the craft struck the ground; if the propeller and leading edges of the plane were much damaged, it could be assumed that there was enough force of impact to damage the vertebral column. It was not always safe to rely on the presence of pain in the diagnosis. Many patients who had had flying accidents had had definite pain in the lumbar region for varying periods, with a site of maximum tenderness over a particular vertebra. All those recovered without residual symptoms. It was considered that they had had compression without fracture.

It had been suggested, Group-Captain Wells said, that severe compression might cause such a bone lesion that absorption of bony tissue ensued after a period, and he asked whether there were any means of detecting this. Could such a danger be avoided by giving calcium vitamins, or carrying out a course of endocrine therapy? The X rays seemed only to be definitely useful in these cases some time after the injury. The safe policy seemed to be to regard and treat all cases of pain in the back after injury as potential fractures, though if this were made a rule there would be a good deal of unnecessary loss of manpower. When there were obvious injuries to head or other parts after an accident, there was a tendency to forget the chance of serious damage having occurred to the spine.

The Surgical Aspect.

Sir PERCY SARGENT said that the spinal cases he had seen since the war had been due to two common types of cause. The first were those occurring in colliery accidents, the second those due to a fall in the hunting-field. In the first of these classes, a mass of coal fell on the back of the miner while he was in the stooping posture. In the accidents while hunting the mechanism was not always apparent, but hyperflexion of the spine often played the chief part. When the force was extreme, a common dislocation-fracture ensued. It was not his purpose now to speak of gross injuries. A common type (which he depicted on the screen) was one in which one of the bodies was broken off, and usually another piece was pushed back into the spinal canal, causing an angular deformity. In the case illustrated, though the patient lived for some time afterwards, no change had apparently occurred in the architecture of the cancellous tissue of the bodies. In most cases of crush-fracture there must be something more than mere damage to bodies of vertebræ. The cauda equina might be damaged without any obvious bony injury, and without any symptoms occurring at the time; yet the foundations might be laid for traumatic lesions of cord and nerve-roots.

Referring to cases in which no conspicuous damage was done, but in which patients might suffer considerably at a later date, Sir Percy emphasised the need for a special effort to make a firm diagnosis at an early stage. In cases of apparently minor injury to the spine it was advisable to impose a probationary period, not only for rest but also for observation and treatment. A systematic neurological examination should be made and the results recorded; this should be repeated from time to time in case physical signs should come on later. Lateral as well as antero-posterior skiagrams should be taken in every case. In a case shown on the screen the usual antero-posterior skiagram showed nothing abnormal, but a lateral picture revealed a gross lesion with telescoping of the bodies. Attention should be directed to the condition of ligaments and muscles, because of the pains and the possible onset of bony deformity later. A spine which appeared radiographically to be normal immediately after the accident might afterwards show atrophy and collapse of one or more vertebral bodies, as after a crush-fracture. He deprecated the use of the terms "Kümmell's disease" and "post-traumatic spondylitis," as these implied disease or inflammation, neither of which was present. In the condition described by H. Kümmell, of Hamburg, the probable explanation was a mechanical one, excessive pressure being brought to bear on the vertebral bodies, the posterior ligaments and muscles having been so damaged that they did not take their due share of the burden. This condition was likely to be progressive unless treatment was adopted with the aim of supporting the spine from behind; a spinal brace should be used, the muscles being exercised meanwhile—an essential point. Massage seemed to have no other effect on the muscles than improving their nutrition; the effective treatment of muscles consisted in the induction of rhythmical graduated contractions by Morton Smart's or some similar apparatus. The results so obtained were extraordinarily good.

In some cases symptoms of pressure on the cord appeared months or even years after injury of apparent unimportance. To these Sir Victor Horsley applied the name meningitis circumscripta serosa. A coal-miner who had been crushed came to hospital 16 years later. He then had numbness and weakness of the legs, and tingling sensations. Knee- and ankle-jerks were absent. There was an impairment of sphincter control, not objective sensory loss. An angular deformity was found in the lumbar spine, and rarefaction of the bodies of the lumbar vertebræ. Protein content was 2 per cent. Laminectomy was performed, and the cauda equina was found angulated over a prominence. The patient left the hospital well after operation. It was a case of meningitis circumscripta, undoubtedly following injury.

In dealing with victims of aeroplane accidents who showed no sign of spinal injury, it should be remembered that though temporary incapacity in respect of muscles and ligaments was common, more serious latent effects, such as secondary spinal cord symptoms, were comparatively rare. Prolonged incapacity from pain and minor lesions could be prevented by appropriate treatment of damaged muscles, combined with such rest to the parts as might be indicated in any given case. Patients who showed even slight and transient signs of cord injury must be treated with great respect, in view of the possible development of more serious symptoms later.

The psychological aspect of these cases, Sir Percy concluded, was also of importance; how far that affected men in the R.A.F., Group-Captain Wells could perhaps say. In his own experience there was a wide psychological difference between cases occurring in the mine and those taking place in the hunting field. Victims of the hunt had the one ambition to get back to their ordinary life as quickly as possible, whereas in the miner's case the question of compensation loomed large.

Discussion.

Air Vice-Marshal D. MUNRO said the accidents in the Royal Air Force corresponded more nearly to those in the hunting-field than to those in the mines. No claims for compensation had been made in the Service on account of spinal injuries, nor had there been any cases in which there was even a suspicion that psychology had anything to do with it. He particularly asked what was the pathology of cases in which symptoms of injury were so long delayed and why the indications remained so long latent

Did rarefaction gradually take place on account of continued pressure on bone which had been somewhat damaged?

Surg. Vice-Admiral A. GASKELL said that in the Navy both kinds of injury to the spine which Sir Percy Sargent mentioned were met with; men had sacks of coal fall on their back while stooping, and in that branch of the service were many men who were fond of horses and seized every opportunity to hunt. He agreed that the great difficulty when a man had sustained a crash was to know what damage had actually been done to the spinal column. Prof. Hey Groves had recently stressed the great importance of radiograms in different directions in cases of injury. When a softening or rarefaction of bones took place, Nature's lines were disturbed, and so the vertebral column assumed a different angle, leading in course of time to pain and stiffness.

Major J. M. WEDDELL pointed out that sometimes the casual accident was only a minor one, nothing like so great as in an aeroplane crash, and this made the difficulty of diagnosis the greater. Often there was a site of localised hyperæsthesia, and a radiogram would often show a wedge-shaped or deformed vertebra, but not in early stages. In one case only after three careful radiograms was a fissure-fracture revealed.

Dr. BERTRAM SHIRES discussed the radiological aspect of the question. He said that in some of the cases if a skiagram were taken in both aspects immediately after the injury evidence of damage might be revealed, but often a radiogram was not called for until a considerable time afterwards. If this course was followed at a very early stage, few cases would in future be missed.

Dr. MORTON SMART remarked that he did not think anyone was able to say how much the posture of the body was dependent on the bony part of the spine, and how much on the muscular and ligamentous part. He had been much impressed by the importance of the muscle factor in keeping the body erect. When injury to the spine took place, the muscles—the first line of defence—must give way, and so in fractures of the spine there was injury to muscles, probably also to ligaments; and in many cases keeping in bed brought about almost complete recovery. In most cases, however, soon after getting about again, the patient had a variety of pains in the back, and some pains referred to other parts of the body. This, he considered, was because the muscles, in the course of their repair, became adherent to neighbouring tissues. One result of accident to muscles was that they became quite atonic, and at that stage the efforts of the nervous system to produce contraction were wasted.

Mr. CECIL WAKELEY said that most of these cases in civilian life were due to pressure fractures; fissuring might occur on only one side. An X ray picture taken in the extended posture would often show the fissure. If it was not very definite, another skiagram should be taken from the other side.

Mr. PATERSON ROSS said it was important to ascertain what produced the atrophy; he thought it might be centred in the question of pain. The spine consisted of a series of joints, and a painful joint always resulted in atrophy of surrounding muscles because of the pain, and this atrophy probably led to the wedge-shaped deformity.

Surg.-Commander J. L. PRISTON, dealing with the psychological aspect, suggested that people meeting with accidents in the hunting-field generally had grit, vulgarly called "guts," and were determined to do their best to get back to ordinary life; while in the case of workers in mines and elsewhere the compensation factor was always present to mitigate the eagerness for recovery until the monetary matter had been settled.

The CHAIRMAN suggested that in some of the cases under discussion an important factor was the presence of torn ligaments.

Reply.

Sir PERCY SARGENT said the reason these bones collapsed at a later date was unknown. In some cases examined post mortem, nothing was found but a crumpling of the cancellous tissue of the bone, with hæmorrhage into that tissue. That, however, did not explain the tardy symptoms. He agreed with Dr. Smart that immediately after a muscle had received a severe injury it was actually paralysed.

SECTION OF TROPICAL DISEASES.

A MEETING of this Section was held on Feb. 7th to discuss

MONKEYS AND HUMAN DISEASE.

The chair was taken by Dr. J. B. CHRISTOPHERSON, the President, and the zoological relationships of the primates were first reviewed by Mr. R. I. POCOCK, who contrasted the hands, feet, and habits of the cynomorpha—or monkeys—which were essentially quadripedal on the ground and expertly arboreal, and the anthropomorpha—or apes—which had relatively very long arms and never rested the palm of the hand on the ground. Young apes, he said, could run very well on the legs alone, putting the weight on the heel, like man and unlike the monkeys, which never rested on the heel. Monkeys climbed on the tops of branches while gibbons swung on their hands beneath. The apes seemed to have learned to climb secondarily. The greatest difference of all between man and ape was in the foot; man's foot was unique, and never at any stage of its development showed the divagation of the great toe found in apes and monkeys. Perhaps the appearance of man had driven the apes back to the trees.

Mr. R. LOVELL dealt with

Bacterial Diseases of Monkeys.

He said that no authenticated case of bacterial disease in the natural wild state was on record. Diseases occurring spontaneously in captivity were (*a*) respiratory, (*b*) digestive, and (*c*) tuberculosis and other infections. Epidemics of pneumonia had been recorded, and pneumococci, types 2 and 4, hæmolytic streptococci, and the influenza bacillus had been isolated. Vaccine treatment had been successful on one occasion in stopping the spread of infection, and overcrowding had been adduced as an ætiological factor. An epidemic of colitis amongst baboons had been due to *Bacillus aertrycke* Mutton. Morgan's No. 1 bacillus and Flexner's bacillus had also been isolated from monkeys of various species suffering from gastro-intestinal symptoms. There seemed no doubt that Morgan's bacillus could be pathogenic in monkeys, though the part it played in summer diarrhœa of children was doubtful. An unidentified non-motile Gram-negative bacterium, producing acid in dextrose, maltose, and mannite but not in lactose or sucrose, had been isolated from a number of monkeys showing post-mortem intestinal infection; this organism was allied to the dysentery group. Tuberculosis was a common cause of death among captive monkeys; human and bovine types were equally virulent but death was almost always due to the former. Two Barbary apes had died from infection by a member of the pasteurella group and one chimpanzee from a staphylococcus septicæmia. Experimentally, monkeys had been used for many organisms affecting man—e.g., Malta and yellow fevers, to both of which they were very susceptible. Pneumonia could be caused by insufflation of pneumococci and the influenza bacillus, and meningitis and leprosy had also been transferred to them.

Mr. E. HINDLE'S paper on

Virus Diseases of Monkeys.

was read in his absence by the Secretary. It pointed out what favourable subjects monkeys were for experiments with filterable viruses. Yet monkeys in the wild state did not seem to be susceptible to these organisms, except rabies. Nevertheless, yellow fever epidemics seemed to be preceded by the deaths of large numbers of monkeys. Monkeys so rarely came in contact with man that their importance in

disseminating disease must be very slight. In India, however, large numbers of semi-domesticated macaques lived in close contact and might serve as reservoirs of rabies. The experimental study of yellow fever had depended almost entirely on the discovery that the Asiatic species, particularly *Macacus rhesus*, were susceptible, although local monkeys had complete natural immunity. There seemed no correlation between virulence of a strain in man and in monkeys; indeed, there seemed some reason for thinking a mild strain in man might be most dangerous to monkeys and vice versa. Nevertheless, the virus retained its virulence for man even after repeated passage. The virus could pass through the unbroken skin of the animal. The only certain way of recognising the disease in them was by the post-mortem appearances, which were identical with those in man. The virus did not, however, disappear from the blood and internal organs after a few days of infection as it did in man.

The vaccination discovered through work on monkeys gave a high degree of success in animals and had been used successfully in the Rio de Janeiro outbreak.[1] It seemed likely to prove a satisfactory form of protection.

Poliomyelitis had so far been reproduced in monkeys only, and subdural injections of suspensions of the spinal cord and cortex would carry it on, with increasing virulence until 0·001 c.cm. of a 5 per cent. suspension would kill every animal injected. The human disease was closely simulated, both clinically and post mortem, and experimental work depended on this. Measles had been produced in monkeys by intratracheal insufflations of filtered nasopharyngeal washes from patients, and transmitted to other monkeys and immunity produced thereby. Other virus diseases, such as small-pox, trachoma, and Rocky Mountain fever, found good hosts in monkeys but usually would infect other animals as well. Monkeys were, however, preferable because the course of their disease more closely resembled that in man.

Dr. T. W. CAMERON dealt with

Protozoal and Helminthic Diseases,

embodying a contribution on protozoa from Dr. J. G. THOMSON, who said that comparative study showed that the species in men and monkeys were in many cases identical. Histolytica-like amœbæ had been found in monkeys but were seldom associated with acute dysentery, although they seemed exactly similar to the *Amœba histolytica* of man. Several genera of flagellates were found both in men and monkeys; they were morphologically similar in the two hosts and probably identical. Man might be infected with *Balantidium coli* from pigs, and monkeys could be infected from the pig or man. There was no reason to doubt that monkeys were naturally infected with human trypanosomes, which could readily be subinoculated in them. The presence of malarial parasites in several species had been recorded, but there had only been one positive infection with *Plasmodium vivax* by the injection of human malarial blood. There was no proof that the organisms were identical or that apes could have human malaria.

Turning to his own paper, Dr. Cameron said that the dozen common and important helminths in man belonged either to the flat worms or the round worms. None of the important trematodes of man, except the blood flukes, had been found naturally in monkeys. All the species had been passed to monkeys experimentally and *Schistosoma mansoni* had recently been found naturally among West African green monkeys in St. Kitts. Apart from this organism the natural flukes of monkeys were more closely related to those of bats and ruminants than of man. None of the typical cestodes of man had been reported from primates, but the typical simian genus bertiella had been found occasionally in man. The most important larval cestode accidentally harboured by man was the hydatid, which was also found in monkeys. In man about 75 per cent. of the primary infections were hepatic, but in monkeys 50 per cent. were pulmonary. This distribution was also characteristic of carnivores, rodents, and cattle, and was due to large hepatic vessels, which passed the parasite through the liver. The characteristic human nematodes were ascaris, enterobius, trichocephalus, œsophagostomum, physaloptera, trichinella, hookworms, guineaworms, and filariæ. *Ascaris lumbricoides* was a very rare accidental simian parasite, but monkeys harboured various species of enterobius, though *E. vermicularis* was peculiar to men. *Trichocephalus trichuris*, the most widespread human parasite, was also the most universal monkey-worm, although present in small numbers. Ankylostoma was not found in monkeys, but necator was. Monkey filarias were a distinct genus of which the nearest human relation was *F. perstans*. There were several common monkey œsophagostoma. *Physaloptera caucasica*, a common baboon parasite, had been fairly often found in man. Trichinella could be conveyed to monkeys but did not reach them naturally. Apart from the whipworms, the commonest simian nematodes belonged to the genus subulura, which never occurred in man. The monkey was a definite reservoir host of schistosomes and possibly also of physaloptera and trichocephalus. It was extremely probable that African monkeys harboured *S. mansoni* and *S. hæmatobium*, and that physaloptera had some intermediate host.

Lice and their Bearing on Phylogeny.

Dr. V. B. WIGGLESWORTH said that bird lice had been shown to have a racial distribution. From a study of their parasites it was possible to say that gulls were merely plovers which had changed their form and that flamingoes were just comic ducks masquerading on stilts. The sucking lice peculiar to the mammalia were less abundant. The first group consisted of a single species found only on elephants, both in Africa and Asia. The second group—hæmatopinnidæ—included nearly all the lice of mammals, while the third—pediculidæ—was confined to the primates. Pediculus was found only on man, the chimpanzee and the two gibbons, and also on the spider-monkey of South America. This monkey had been shown to possess characteristics of hair and blood very closely allied to those of the anthropoids and man. Perhaps it was in virtue of these that pediculus had passed from an anthropoid to one special monkey at a period that must have been very remote, as several species had since been differentiated. The crab-louse, long believed to be peculiar to man, had been found by Ewing on the gorilla.

Colonel A. E. HAMERTON described the specimens which he had brought from the Zoological Society's prosectorium to illustrate the morbid histology of monkeys. These included a number of cases of generalised tuberculosis, and a case of mixed mycosis and tuberculosis in a wanderoo macaque. He remarked on the fact that monkeys found riddled with tuberculosis post mortem often showed no symptoms up to the day of their death. Another specimen showed a placenta prævia in a rhesus macaque which had died of hæmorrhage at the end of the first stage of labour. Others showed sarcoma of the lung in an orang-utan with metastases in the liver, spleen, and left kidney; a sarcoma of the right kidney with extensive spread in a capuchin; mitral vegetations in a Pluto cercopitheque—an uncommon condition; intussusception in a macaque, and hæmorrhagic ulceration of the bowel, due to *Bacillus aertrycke*, in a baboon.

Discussion.

Dr. H. H. SCOTT described the *B. aertrycke* outbreak on the monkey hill at the Zoo, due to a carrier and temporary blockage of the water-supply, and a case suggesting that pneumonia in a green cercopitheque had begun as a primary blood disease, settling secondarily in the lung.

Dr. A. BALFOUR recounted his experience in Trinidad, suggesting that monkeys might act as a natural reservoir for yellow fever.

[1] THE LANCET, Jan. 26th, p. 183.

Dr. G. C. LOW did not see how the red howler monkey could have anything to do with yellow fever epidemics, as it never came in contact with human beings. Yellow fever was typically a seaport disease and occurred where there were no monkeys.

Dr. KINGSTON BARTON and Colonel BROUGHTON ALCOCK asked some questions, to which Dr. LOVELL, Dr. SCOTT, and Colonel HAMERTON replied.

SECTION OF UROLOGY.

AT a meeting of this Section on Jan. 24th, with Mr. SWIFT JOLY, the President, in the chair, a paper on

TRAUMATIC RUPTURE OF THE URETHRA

was read by Sir WILLIAM WHEELER. The contribution, was founded, he said, upon six cases encountered during the years 1921–28. The condition was a rare one; only 41 fresh cases of it had been admitted to the wards of the London Hospital in the ten years 1909–19, and only 20 cases had been admitted to the Liverpool Royal Infirmary during the past decade. Rupture was far more common in the bulbous portion of the urethra, well in front of the triangular ligament, and it was known that if the membranous segment was severed it was exceptional for a tight stricture to develop in the process of healing. It had been stated that in France the accident usually occurred in young adult men, but the speaker did not think this was so in all countries; in his own six cases the average age was 42, while in Mr. Frank Kidd's 57 cases it was 33 years. Sometimes extravasation from the injury was seen in the anal region, the ischio-rectal fossæ, and the thighs. Anatomical limits were more commonly overrun in non-traumatic rupture occurring behind old infected strictures. In the first case of Sir William's series the urethra was torn off near the neck of the bladder, above the triangular ligament, and before operation the outstanding feature was a spread of urine and blood into the perinæum, scrotum, penis, and the front of the abdomen, in a way characteristic of rupture in the region of the bulb.

Diagnosis.

When the urethra ruptured well in front of the triangular ligament a perineal hæmatoma nearly always followed; blood trickled from the meatus almost immediately, and though the patient had an intense desire to pass water he could not do so. The local pain was severe. Extravasation of urine was prevented by reflex spasm of the compressor urethræ muscle until hours had elapsed. But for this saving spasm the mortality from early extravasation of urine and infection would be much higher. Often the amount of bleeding from the meatus after the accident was in inverse proportion to the urethral damage; after only partial division the hæmorrhage was likely to be more profuse and continuous than it was after complete rupture, for in the latter event hæmostasis was favoured by retraction of the part. Large hæmatomas might be found even when there had been no rupture if the corpus spongiosum was seriously damaged but the mucous membrane did not yield. Also severe traumatic stricture might follow injury without rupture. If the pelvis was broken the rupture was more likely to take place above the triangular ligament, in the region of the apex of the prostate. But it might be between the bladder and the bulb. The surgeon should always have in mind the possibility of a ruptured bladder above or below the reflection of the peritoneum. Because a ruptured bladder was empty it could never be palpated. A catheter could be passed freely through the urethra, but only small quantities of blood-stained urine came away. The extent of injury would be found at operation to be greater than had been anticipated judging by the signs and symptoms immediately after the accident; and this fact was a strong reason for operating in every case. A black patch on the glans penis indicated that probably the whole of the corpus spongiosum was infiltrated with urine. When there was extravasation in traumatic cases the absence of pre-existing infection (present in old-standing stricture cases) gave a relatively better prognosis, especially as the victims of the accident were usually in good health when it occurred. If operation was delayed, and the patient did not die, the parts became riddled with sinuses and urinary fistulæ—a very grave condition. Associated pelvic fracture should be treated.

Treatment and Results.

Sir William Wheeler laid stress on the importance of a uniform method of early treatment in these cases. One of his six patients died ten days after operation from pneumonia. This patient, whose age was 27, was operated on at an early stage, and there was no fractured pelvis or other complication. His rupture was in the region of the bulb. The other five patients in the series reported themselves cured after periods ranging from seven years to five months. Operation must not be undertaken hurriedly; good results largely depended on complete hæmostasis and asepsis. A hypodermic injection of morphia was given, and the distended bladder was, if necessary, emptied by suprapubic puncture before removing the patient to hospital. In describing his operative technique Sir William pointed out that when the rupture of the urethra was intrapelvic, the pubo-prostatic ligaments were torn and the bladder became displaced backwards. In such cases the retained catheter was necessary. The literature of the subject, he said, disclosed a general consensus in favour of immediate suprapubic cystotomy in fresh cases of ruptured urethra. The proximal end of the urethra —notoriously difficult to find—could be hit upon by retrograde catheterisation. By employing a retention catheter for about a fortnight and avoiding perineal drainage, four advantages were claimed: the patient was much more comfortable and nursing was simplified; there was a minimum of scar formation in the perineum; subsequent instrumentation was simplified; and convalescence was hastened.

Discussion.

Mr. RALPH THOMPSON said that in a long series of cases at Guy's Hospital the deaths following venereal stricture were 48, and following traumatic stricture two. In about one-third of the cases of fractured pelvis the urethra could be expected to be damaged. In most of the cases of ruptured urethra which came to the genito-urinary department at Guy's nothing seemed to have been done for the patients; no suprapubic cystotomy was carried out, nor any effort made to unite the ends of the ruptured urethra. The profession at large should be told of the importance of operating to deal with the urethra as soon after the accident as possible. The urethra might be only partially ruptured.

Mr. FRANK KIDD hailed with satisfaction this insistence by a distinguished general surgeon on the necessity for paying attention to this subject, and reminded the meeting of his analysis, in 1921, of a series of 57 cases at the London Hospital, showing how seldom the injury occurred. That 24 out of 25 of his patients remained alive showed that the accident was not so serious from the standpoint of life as many supposed. As a result of examining many cases he had arrived at the conclusion that the real cause of stricture formation was a pulping of the tissues. He did not think the use of a catheter made any difference to the occurrence of stricture. It was quite simple in these cases to make a small incision into the bladder, under an anæsthetic, straight away; then retrograde catheterisation could be carried out. Bad stricture cases which were causing trouble did very well after internal urethrotomy.

Mr. FOWLER WARD said he thought the end-results largely depended on the age and weight of the person and the stage the condition had reached by the time the surgeon was called in. In children he usually found that the injury was not severe, and under suitable treatment healing was prompt. When a

heavy man fell astride anything the injury to the urethra was generally very severe, and the case was not seen by the urological surgeon until the third or fourth day afterwards, the statement being that the patient had not passed water for a day or two. The tissues might have sloughed, and if so there was no chance of immobilising the ends of the ureter and bringing them together. What he had aimed at in several cases was passing a catheter through the penile urethra, and, if this was not possible, doing suprapubic cystotomy and retrograde catheterisation. He always preferred the use of silver catheters to rubber ones, as the latter occasionally became very objectionable.

Mr. WINSBURY WHITE described a case of fracture of the pelvis involving partial rupture of the urethra. In a run-over accident seven years ago the boy had his symphysis pubis separated about an inch, and there was considerable extravasation of blood in the perineum and external genitals, as well as in the upper part of the right thigh. No sign now remained of extravasation of urine, and he could pass urine freely.

Mr. CYRIL NITCH said that in two of three cases he had seen in children there was severe injury to the urethra and also associated fracture of the pelvis and crushing of the membranous urethra. Much scar tissue formed in consequence. He agreed with Sir William Wheeler that the best —indeed the only—line of treatment of these cases was to drain the bladder and suture the urethra.

Mr. HUGH LETT said that years ago Mr. Reginald Harrison pointed out that, where there was a leakage of urine, dense fibrous tissue was always met with. There was every reason for opening up the bladder in the first place in these cases and doing suprapubic drainage. He also dwelt on the advantage of retrograde catheterisation.

Mr. G. E. NELIGAN also emphasised the importance of suprapubic drainage of the bladder in these cases, followed by the tying-in of a catheter. In the type in which a person who had been run over sustained a fractured pelvis, and an injury between the prostatic and membranous urethra, there was often difficulty in getting the ends of the urethra together. He described his own modus operandi in these cases.

THE PRESIDENT said that four of the seven patients with this accident whom he clearly remembered were under the age of 20. Rupture of the urethra could follow a trifling accident. When the posterior urethra had been ruptured it was sometimes very difficult to decide what should be done, especially when the pelvis was fractured at the same time. But suprapubic cystotomy must be the first step.

Sir WILLIAM WHEELER, in reply, emphasised again the necessity of not hurrying the undertaking of the operation in these cases. If the bladder was dilated it was best to aspirate it. He did not use crutches in doing these operations; he found it better to give one leg of the patient each to an assistant, so that tension could be transferred at a moment's notice.

DONATIONS AND BEQUESTS.—The late Mr. Charles G. Arbuthnot, of Eaton-square and Knowle, Cranleigh, Surrey, left, among other bequests, £5000 to the Grosvenor Hospital for Women, and £1000 each to St. Andrew's Convalescent Hospital, Clewer, St. Andrew's Convalescent Hospital, Folkestone, and the Cancer Hospital, Fulham-road. —Mr. Alfred Charles Bunting, of Woodlawn, Uttoxeter, Staffs, left £500 to the Uttoxeter Nursing Association, £100 each to the North Staffordshire Infirmary and the Derbyshire Royal Infirmary, and, after other bequests, the residue of his property to his wife for life, with remainder as to one-fourth equally between the Uttoxeter Nursing Association, the North Staffordshire Infirmary, and the Derbyshire Royal Infirmary.—Mr. W. Weddell, of Hampstead, left £1000 each to the London Hospital and Dr. Barnardo's Homes, and £500 each to the Hampstead General and North-West London Hospital, St. Columba's Hospital, Swiss Cottage, the Royal Hospital and Home for Incurables, Putney, the Poplar Hospital for Accidents, St. Bartholomew's Hospital, and several other institutions.

MEDICAL SOCIETY OF LONDON.

EARACHE.

AT a meeting of this Society held on Feb. 11th Dr. J. WALTER CARR, the President, being in the chair, a discussion on this subject was opened by Dr. H. MORELAND MCCREA from the

Standpoint of the General Practitioner.

Earache, he said, might be a localised pain, a referred pain, or a transferred pain, and it was important to remember, when confronted with the complaint that there was an intimate nerve connexion between the ear, the teeth, the tonsils, the larynx, the cervical plexus, and even the heart, the main lines of this nerve Clapham Junction being the vagus, the fifth cranial, and the glosso-pharyngeal. He had seen a striking example of transferred pain in a patient whose attacks of angina pectoris always began with violent earache. The first problem to be solved by the doctor seeing a case of earache was to ascertain whether the pain was due to a lesion of the auditory apparatus or not. A neglected otitis media might be one of the most serious conditions which the general practitioner was called upon to treat; there were 1047 deaths from this in England and Wales last year. Pain in and discharge from the ear were frequently caused by furunculosis in the skin lining the external auditory meatus. *Staphylococcus aureus* was usually present in this. Sometimes earache with deafness and some swelling was due to the presence of aspergillus nigra. Minor causes of earache might be the presence of cerumen in the meatus, increase of atmospheric pressure due to blocking of the tubes, or a catarrhal cold. After every injury such as a fall on the head the auditory apparatus should be carefully examined. If no local cause for the earache could be found, regions from which pain could be transferred or referred should receive attention; especially should teeth and tonsils be inspected in a good light. Earache due to acute tonsillitis might persist even after the tonsils had been enucleated. Intense pain in the ear sometimes ensued from a buried wisdom tooth. Ulceration or erosion of the tongue could cause earache, and when this was the case the symptom was aggravated by the mastication of food; it could also accompany early cancer or tubercle of the larynx. Theoretically, sinus trouble ought to be a cause of earache, but he had not met with such a case.

Mr. HERBERT TILLEY dealt with the subject from the

Standpoint of the Aural Surgeon.

The gravity of the lesion, he said, might bear little proportion to the severity of the pain. A furuncle of the meatus, though of little danger to life, might render life intolerable for days because of the acute pain, while an earache which amounted to no more than discomfort might be the only subjective symptom of retained sepsis close to the temporal meninges.

Of *intrinsic causes*, a foreign body pushed into the meatus of a child might have caused laceration and pain. If the body was a small bean or grain of corn which swelled under warmth and moisture, intense inflammation might spread to the tympanic membrane. If not impacted the body might be removable by gentle syringing. Otherwise under a general anæsthetic a curved probe or hook should be used, under a good light, for its removal. In adults there might be a foul pledget of wool which had been forgotten. It was not unusual for a collection of cerumen to cause earache when it pressed against the tympanic membrane; patients might even complain of vertigo. One must not mistake for wax, however, the brown coloured adherent accumulation in the depth of the meatus known as a cholesteatoma. This was frequently associated with chronic suppuration in the tympanum or mastoid antrum and cells. When furunculosis occurred in the ear, owing to the resistance of the parts, the pain was continuous and intolerable

and any movement of the mandible accentuated the pain. Unless the drum membrane was involved, however, hearing was not affected. In the differentiation of mastoiditis from furuncle the following points should be remembered: The hearing would probably be normal in the case of furuncle, but not likely to be so in mastoiditis. If meatal inflammation alone was present any movement of jaw or auricle would greatly accentuate the pain, but that of mastoiditis would be scarcely increased by it. Direct pressure on the oedematous area would not greatly accentuate the pain of furuncle, but it would definitely do so when inflammation was present in mastoid antrum or cells. If the case was difficult and one could not exclude mastoid involvement, the region should be explored and the furuncle freely opened. The risk of this would be much less than that of leaving a possibly infected mastoid without free external drainage. In treatment hot fomentations over the auricle and the insertion of a strip of gauze soaked in warm lotio plumbi et opio might relieve the early inflammation, and the internal administration of aspirin, pyramidon, or similar remedies greatly lessened the earache. If, as was usual, the pain continued, a brief general anæsthetic should be given, the meatus sterilised, and a free, deep incision made into the abscess. Relief followed immediately. A staphylococcus vaccine often prevented a recurrence of the furunculosis.

Acute inflammation of the middle-ear cleft provided the physician with most of his cases of severe earache, and it was practically always accompanied by symptoms of a general toxæmia. Infection occurred by way of the nasopharyngeal orifice of the Eustachian tube. Middle-ear infection was common between birth and puberty, because then the nasopharynx had its full complement of lymphoid tissue, tissue which constituted an excellent medium for the growth of micro-organisms. He impressed on students that when they were called to an infant who was restless, fretting, or screaming, the abdomen or the ear should be regarded as the most likely seat of the trouble. If the abdomen could be excluded each tympanic membrane should be examined, and with present hospital facilities it should be easy to detect the difference between a normal opalescent tympanic membrane and one which was red and congested. The infant's hand would be tossed towards the affected ear, and the child would tend to lie with the inflamed ear uppermost. Some pyrexia would always be present, and some gave to the symptoms the name "meningism." There might be no discharge until these symptoms had lasted 24 to 48 hours or longer, and it was not wise to wait for discharge before attempting a diagnosis. If, however, discharge had commenced when the patient was first seen the meatus should be cleaned and an effort made to ascertain the site and size of the perforation in the tympanic membrane and the condition of the meatal walls. A magnifying Siegel's speculum would facilitate this. With regard to treatment, if acute inflammation of the intact tympanum was present the tympanic membrane could be incised under general anæsthesia in a child, while in an adult anæsthesia could be produced by applying a solution containing cocaine, carbolic acid, and adrenalin chloride. It was his firm conviction, said Mr. Tilley, that when the tympanic membrane was acutely inflamed and uniformly congested, paracentesis should be performed; clean and free incision through the posterior half of the drumhead gave immediate drainage, and so saved the delicate middle ear from possibly irreparable damage, and might also hinder the spread of infection to the mastoid antrum. If, on the contrary, one waited for spontaneous rupture of the membrane to take place suffering would be prolonged and danger would be increased. Pain on pressure over the mastoid was practically always present during the first few days of an acute inflammation of the middle-ear cleft, but it did not always call for immediate surgical exploration.

Milder and more fugitive forms of earache in children should be regarded as a warning of infection of Eustachian tube and middle ear, and adenoids would be frequently found in these cases. Inflammations of the middle ear met with in the course of influenza were often rapid in onset and severe in degree, and there might be found hæmorrhagic blebs on the deep meatal walls. Here early incision of the membrane was even more essential than in the more common types of inflammation. In chronic suppurative otorrhœa earache should be regarded as a symptom of significance, as it meant that septic products were being retained under tension in the middle ear or its adnexa. It was necessary to make free exposure and drainage of a septic focus. Earache, too, might be complained of by patients having chronic non-suppurative inflammation of the middle ear cleft which had produced cicatricial changes in the tympanum, or a sclerosis of the mastoid bone. The pain in these cases was usually dull and boring.

Of *extrinsic* (or referred) *earache*, one seat of trouble was the sphenoidal sinus and its neighbourhood. A lady suffered from bouts of pain every four or five days, and the sudden cessation of symptoms always followed a feeling of something having burst in the head, when she had an unpleasant smell in her nose. Drainage of the sphenoidal sinus entirely cured her. An essential condition for the transference of pain from a visceral region to the body surface was that the ganglion cells of the afferent fibres of both these regions should be located in proximity in the same sensory ganglion, while centripetal processes from both sets of cells passed together into the bulb.

Discussion.

Sir JAMES DUNDAS-GRANT spoke of methods of examining the tonsil to avoid missing disease. If the tonsil were anæsthetised with guaiacol and olive oil and the ear pain then ceased, one knew the tonsil was the cause of the earache. Many patients sent for urgent mastoid operation were found to have furuncle; it was a real trap. Often an enlarged submaxillary gland caused earache; a concretion in Wharton's duct had the same effect. In one case of severe earache he found an epitheliomatous ulcer at the root of the tongue.

Dr. T. H. JUST emphasised the great value of the electric auriscope in practice, though it was not popular with some older practitioners. Some held that to operate on the mastoid in a doubtful case and find the condition was furunculosis was anathema, but it was playing for safety, and was no more to be criticised than removing the appendix needlessly. Herpes zoster oticus was, he considered, easy to diagnose in the early stages, but not always so if neglected when facial paralysis might be present and nerve deafness severe. Diagnosis rested on hearing and labyrinthine tests.

Mr. HAMBLIN THOMAS said that if streptococci got into a small abrasion behind the ear in a child the condition might be mistaken for acute otitis media. Sometimes an accumulation of wax had, by pressure, eroded the skin, so that even after removing the wax the pain might persist, calling for local treatment. Carbolic acid and glycerine instillations into the ear might relieve pain for the time, but they might remove the superficial layers of epithelium. People with high blood pressure and arterio-sclerosis might have very definite earache in consequence.

Dr. E. C. STEELER said he had always found it safer and better at once to open an inflamed and protuberant drum than to allow it to rupture of its own accord.

Reply.

Mr. TILLEY said that if there was present an early stage of malignant disease of the middle ear, the light touching of the small granulations with a probe caused instant bleeding. Concretions due to other causes, however, bled to a less degree, and only after there had been considerable manipulation of them. He had seen only two cases in 30 years of pain in the ear due to sphenoidal sinus suppuration.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting on Jan. 10th, a discussion on

THE INJECTION TREATMENT OF VARICOSE VEINS

was opened by Dr. STUART MCAUSLAND. He said that from the histological aspect the process of vein obliteration by injection was essentially a chemically produced irritation of the endothelium which caused the formation of a firm clot; the fact that the clot was firm, together with the phenomenon, radiographically confirmed, that the circulation in varicose veins was downward, and with the innumerable clinical successes which had been obtained without accident, negatived all danger of embolus. Having discussed indications and contra-indications, Dr. McAusland described the technique used by him, and gave the results of his own cases, together with after-effects. He concluded that salicylate of soda and quinine with urethane were the substances of choice; that patients should rest the limb for 20 minutes after injection; and that the advantages of the method were exactly those of hæmorrhoid injections. The treatment was essentially ambulatory, nearly painless, and much cheaper than operation; it was more successful than excision, smaller radicles being reached; recurrence was less likely. The treatment, moreover, avoided the risks associated with operation, such as general anæsthesia and post-operative embolus.

Mr. H. F. WOOLFENDEN emphasised the apparent safety of injection treatment, in so far as the risk of pulmonary embolus was concerned. The thrombus formed was firm in character, the thrombosis being secondary to the chemical endophlebitis and resembling the tough fibrinous thrombus met with in aneurysm. The convenience of the treatment from the patient's point of view was undoubted and the cure seemed to be as likely to be permanent as that resulting from operation. Certain disadvantages of the method had to be considered. The first was pain, which was sometimes met with at the time of injection when sodium salicylate was used, but it was generally for some days afterwards that patients complained at times of pain and tenderness on the leg. This might possibly be due to part of the injection being outside the vein or to a leak back at the puncture hole in the vein, but it also occurred when the injection was undoubtedly in the vein and was then due to an excessive reaction, causing periphlebitis. This excessive reaction had four possible causes: (1) stronger solution; (2) stagnation in the vein; (3) thinness of the vein wall; and (4) idiosyncrasy of the vein. There was also the possibility of errors in technique causing slough formation by injection outside the vein. This should not occur, but unfortunately it did so occasionally. As to the relative advantages of quinine, sodium salicylate, and sodium chloride, quinine and urethane were most suitable for the peripheral injection of small and moderate-sized veins, but sodium salicylate and sodium chloride given by Colt's technique were excellent for large varices involving the long saphenous system on account of the speed with which cure could be obtained. It was important to bandage the leg after injection, so that the formation of large bulky clots could be avoided.

Mr. J. B. OLDHAM said that on the question of safety of injection treatment, the sceptics advanced the objections: (1) the risk of general toxic symptoms; (2) local complications; and (3) pulmonary embolism. Severe symptoms attributable to excessive doses of quinine had been known to occur, but the speaker found that all these could be obviated by (1) giving a very small initial dose ($\frac{1}{2}$–1 c.cm.) to test the patient's susceptibility, (2) giving not more than 7–8 c.cm. at one sitting, (3) keeping the limb at rest for half an hour after injection. Sicard had supplied experimental proof that solutions injected in varices remained in situ, if the limb was kept at rest, but quickly entered the general circulation when active movement was allowed, and Mr. Oldham had himself made a similar observation following injection of methylene-blue. Local necrosis was almost alway the result of the solution entering the subcutaneou tissues—an error in technique—but occasionally as Mr. Woolfenden had mentioned, necrosis followe what had apparently been a perfect injection Embolism was a theoretical possibility, but th practical clinical evidence of many hundreds o thousands of injections without a fatality—no cas of fatal embolism following a sodium salicylate o quinine injection had been observed—was more tha sufficient to outweigh this theoretical danger. In spit of the unlikelihood of the occurrence of embolism the following precautions were advocated: (1) th patient should not move for half an hour afte injection; (2) technique should be scrupulously aseptic; (3) if possible, excessive muscular activit should be avoided for three to four weeks afte completion of treatment. The advantages ove the operative methods were enumerated, and i was pointed out that one fatal case of embolism happened in every 700 or 800 major operations Mr. Oldham thought that a tourniquet was help ful, and that injections should be given with th patient lying down; quite independently he had com to the same conclusion as had Mr. Woolfenden as t the great advantages of supporting the veins with a bandage for a few days after injection. In case with a positive Trendelenburg sign, good result could often be obtained by a single injection made a proximally as possible, the consequent fibrosis being equivalent to the old Trendelenburg operation and protecting the distal veins from the passive downward reflux of blood.

MANCHESTER MEDICAL SOCIETY.

AT recent meetings of this Society, with Dr. R. W MARSDEN, the President, in the chair, Dr. C. S. D DON read a paper on the

Treatment of Exophthalmic Goitre.

An attempt was made to compare the three line of treating this condition at present adopted— namely, (1) iodine therapy, (2) X ray therapy, an (3) operative procedures. The improvement o otherwise was gauged by a comparison of the basa metabolic rate, the weight, and the pulse before an after treatment. It was found that iodine produce a temporary fall in the basal metabolic rate an pulse and an increase in weight. The fall in th basal metabolic rate and pulse lasted for about month, in some cases longer, while the increase i weight in nearly all cases continued for about fiv months. Iodine by itself cannot cure exophthalmi goitre, and if given and then stopped a second cours has less effect. A number of cases who had X ra therapy for periods over a year were examine repeatedly at intervals of three months, the basa metabolic rate being estimated on each occasion out of a total of 30 cases improvement or cure wa noted in 54 per cent. In 27 per cent. of cases th basal metabolic rate and pulse-rate were found t have returned to within normal limits—regarded a the criterion of cure. Operative procedures were the considered, attention being drawn to the value iodine in preparing for operation. Of 12 cas operated on at least eight months before the date examination a fall in the basal metabolic rate an pulse to normal was found accompanied by a increase in weight in 75 per cent. Of 18 cases ex mined before iodine was given, after iodine was give and two weeks after operation, cure was noted 85 per cent. As a result of his observations D Don advocated X ray therapy without iodine admini tration for six months, and at the end of this perio if the basal metabolic rate and pulse had not cor down considerably, the patient should be giv iodine and then operated on. Cases with bas metabolism of plus 35 per cent. or over should treated by a preliminary ligation; those with a bas metabolic rate below plus 35 per cent. should ha four-fifths of the goitre removed by thyroidectomy.

Reviews and Notices of Books.

)ISEASES OF CHILDREN.

First edited by Sir ARCHIBALD GARROD, F. E. BATTEN, and HUGH THURSFIELD. Second edition edited by HUGH THURSFIELD, D.M., F.R.C.P., and DONALD PATERSON, M.B., M.R.C.P. London: Edward Arnold and Co. 1929. Pp. 1106. 45*s*.

THE appearance of a second edition of this book fter an interval of 15 years will give genuine satis- action and pleasure to medical readers throughout he country. The editors have earned the gratitude of he profession by perpetuating a work which has long emained the most comprehensive and representative roduct of British pædiatrics. The untimely death n 1918 of Dr. Batten removed a great authority on he neurology of childhood; however, continuity of he book has been well preserved by Dr. Thursfield, n collaboration with Dr. Donald Paterson, and aluable contributions from the pen of the original enior editor are included. The revision of so well- nown a work, the individuality of which has as much o do with its form as with its content, must of ecessity present problems of great difficulty. The ditors have made it their object to preserve the riginal arrangement wherever possible. In the reater part of the book sequence of the subject natter of the chapters is similar to that of the first dition, though occasionally the account of a disease as been transferred to a more appropriate section as result of an altered view of its ætiology.

The "prolegomena" appears in shortened form;)r. Gossage's article on heredity remains, and that on nmunity has been rewritten by Dr. D. McLean and Ir. Eric Lloyd. A number of articles have been evised by their original authors, for example, those y Prof. F. Langmead on the new-born, Dr. H. Morley letcher on liver and peritoneum, Dr. Thursfield on he hæmopoietic system, and Dr. J. W. Carr on uberculosis. In some chapters additions and lterations have been made by a new author, the riginal features of the article being preserved; mong these are the sections on respiratory isease, metabolic disorders, and organic disease of he nervous system. An equally high standard has een attained in those chapters which are wholly r mainly new. That on nutritional disease has been ewritten by Dr. L. G. Parsons. The disorders which e describes—infantile atrophy and rickets—are mong those which show most evidence of the advance f knowledge during recent years, and his contribution rovides a lucid statement of modern views on their ausation and treatment. Additions have also been nade to the section on alimentary diseases; more pace is devoted to surgical conditions, and a notable eature is Dr. Reginald Miller's account of cœliac isease. In the chapter on cardiac disease Dr. G. A. utherland has achieved a triumph of condensation, nd has given in a remarkably small space a really lear description of its manifestations, considered in elation to their effects on the genetic, contractile, and alvular systems. The articles by Dr. E. A. Cockayne n the ductless glands and Dr. J. C. Spence on the enito-urinary system both give readable and up-)-date accounts of subjects upon which current pinion has recently undergone much change.

The chapters on the nervous system show the ifficulties of the revision of a work of this kind; a ivision into functional and organic diseases is not so asily achieved as in 1913. The spasmophilic neuroses ave been removed from the section on functional iseases and are considered under rickets, but onvulsions and epilepsy remain, the latter being dealt ith by Dr. W. G. Wyllie. The conditions commonly lassed as neurotic are described by Dr. H. C. Cameron, ho has incorporated some passages known to readers f his works on children's disease. Great praise must e accorded to Dr. Wyllie not only for what he has ontributed himself—such as his excellent article on ncephalitis—but for the skill with which he has preserved the individuality of Dr. Batten's chapter on organic disease. The same high standard is reached by Dr. F. J. Poynton on rheumatism, Dr. B. Schlesinger on infectious diseases, and other contributors, all of whom are authorities on their subjects. A welcome innovation is provided by Mr. P. G. Doyne's concise summary of ophthalmic disease in childhood.

This book has already won its place in the foreground of pædiatric literature, and the editors have done all that can be done to ensure that the second edition will maintain this position.

DIAGNOSIS IN HEPATIC DISEASE.

Praktische Differentialdiagnostik. Für Aerzte und Studierende. Herausgegeben von Prof. GEORG HONIGMANN. Band I. Innere Medizin. Teil 5. *Erkrankungen der Leber und Galle*. By Dr. Karl Glässner, Professor at the University of Vienna. 1929. Dresden and Leipzig: Theodor Steinkopff. Pp. 392. M.4.50.

THIS comprehensive new work written by clinicians working in Giessen, Vienna, Düsseldorf, Breslau, Munich, Cologne, and several other centres in south Germany and Austria is now appearing in handy instalments. There are seven volumes devoted to special branches of medicine or surgery. Each volume is divided into several parts and each part is entrusted to one author. The parts are printed separately and they vary in price and size, the average being 6 marks and 100 pages respectively. Part 5 of Volume 1, on liver and gall-bladder diseases, is written by Dr. Glässner of the University of Vienna. It is a very practical and complete little brochure, well arranged and concise. The author stresses the importance and unfailing value of a thorough physical examination of the patient. Clear accounts are given of radiological methods of investigation and analyses of bile obtained by a duodenal tube. Cholecystography is not, however, given sufficient recognition. The chemical tests of liver function are well explained, but they take a place in the author's technique second to the bed-side clinical investigation by the classical methods. There are no charts or diagrams, and the appearance of spaced lettering on almost every page is a little distracting to the English reader. Some useful tables of differential diagnosis between maladies like "Wilsonsche Krankheit" and "Malarialeber" are included. A large bibliography has the advantage of being quite up to date. It indicates that the author has drawn freely from the writings of Hijmans v. d. Bergh, Aschoff, Chauffard, Wilkie, Eppinger, and Franklin.

THE PROBLEM OF FERMENTATION.

By M. SCHOEN, Institut Pasteur. Translated from the French by H. LLOYD HIND, B.Sc., F.I.C. London: Chapman and Hall, Ltd. 1928. Pp. 211. 21*s*.

THE study of fermentation has played a great part in the history both of medicine and of chemistry. Lavoisier, Gay-Lussac and Liebig, Dumas, Claude Bernard and Pasteur, all these great men and many others have in the past been closely connected with the development of this "most striking and extra-ordinary reaction," as Lavoisier described it. Nor has its significance diminished as knowledge grew. Lavoisier deduced in part from the study of fermentation his statement of the law of the conservation of matter; Pasteur was able to recognise the function of yeast in alcoholic fermentation, and thus laid the foundations of modern microbiology; the work of Liebig, Berthelot, and Büchner led to the modern theory of enzyme action; and in our own day the researches of A. V. Hill and O. Meyerhof have thrown light on the action of living muscle, a subject which has been a source of mystery to investigators since lactic acid was first shown to be a product of muscular action. Hill, by his brilliant micro-calorimetric researches, has been able to explain the phases of muscular contraction, whilst the work of Meyerhof has placed the whole subject on a quantita-

tive and mathematical basis. During the past few years O. Warburg's studies in Berlin have also aroused much interest. He has been able to demonstrate the quantitative difference between normal and malignant tissues as regards glucose metabolism, and here, also, there are certain resemblances in metabolism to that of yeast in the fermentation of carbohydrate.

Prof. A. Fernbach, in his introduction, points out that this book is not so much a complete dictionary of facts as a summary of the ideas to which they give rise. Alcoholic fermentation forms its principal theme, but sufficient space is given to various other aspects of fermentation to stimulate the reader's curiosity. The opening chapters contrast the theories of Pasteur with the enzyme theory of fermentation; bacterial fermentation, and the relation of fermentation to respiration are also considered. The theories in which various intermediate substances in the alcoholic fermentation of sugars are postulated are discussed in some detail, and the function of phosphates in alcoholic fermentation and Harden's theory are dealt with in the succeeding chapters. The final sections are concerned with the influence of the reaction of the medium, and the processes of oxidation and reduction on these reactions. The inclusion of a chapter on hydrogen-ion concentration and its determination appears to be unnecessary, since numerous general text-books of physiology and biochemistry deal adequately with the elementary aspects of this question.

The subject of fermentation is a vast one, to which this monograph may be considered a useful introduction. It contains an extremely useful, up-to-date and well selected bibliography.

ROENTGEN DIAGNOSIS OF ECHINOCOCCUS TUMOURS.

By GUNNLANGER CLAESSEN. Stockholm: Acta Radiologica. 1928. Supp. 6. With 86 illustrations. Pp. 155.

THIS small volume from Iceland is founded on a most careful clinical and radiological research, financed by the University of Iceland, into 44 cases which came under the author's observation. Thirty-seven of these were primary in the liver, and he draws the conclusion that, in Iceland at any rate, primary pulmonary echinococcus cysts are exceedingly rare. In England we so seldom see patients suffering from this infection that there is little literature apart from scattered references and sporadic records of isolated cases. Consequently, the radiographic appearances and diagnostic points have not been very clearly defined. The only other considerable record of radiological investigation of echinococcus that we have seen comes from New Zealand where hydatid disease appears to be comparatively common. C. C. Anderson's work was published in the *New Zealand Medical Journal* of August, 1926. (See also *British Journal of Radiology*, November, 1928.)

Dr. Claessen is to be congratulated on an excellent and complete thesis.

CHARLES DARWIN.

The Man and His Warfare. By HENSHAW WARD. London: John Murray. 1928. Pp. 472. 21*s*.

THE author of this book is interested in the man Darwin, as who could fail to be, but he is even more interested in his warfare. To him Darwin is the protagonist of true science, who with his weapon of observation defeats the forces of theory and speculation. For 2000 years mankind had toyed with the theory of evolution, but it remained a theory till Darwin came. It is his peculiar merit that in an age of speculation he refused to be satisfied with the views of biologists, the beliefs of theologians, and the conclusions of philosophers. Darwin had no use for the doctrine of the armchair theorist, prevalent even to-day, that by intense thought the superior mind can create knowledge. He demanded facts, and he could never have enough of them. For a man with his genius for accurate observation and enormous industry the five years spent on the *Beagle* were invaluable. But they were merely the prelude to 23 strenuous years during which in spite of persistent ill-health the "Origin of Species" was gradually evolved. How the Darwinian doctrine was developed and how it was received is graphically described by Mr. Henshaw Ward. We are so prone to take things for granted that it is difficult to realise the storm of controversy which Darwinism excited only half a century ago. But the author has successfully recaptured the atmosphere for us—and he has done even more, for we finished his book and then turned once again to the "Origin of Species."

THE TEETH AND THE MOUTH.

By LEROY HARTMAN, D.D.S. London: D. Appleton and Co. Pp. 93. 5*s*.

THE great interest taken by the lay public in the teeth has led to the production of a number of books which, written in non-technical language, attempt to convey the principles of dental hygiene with varying success. This work is an example of what in America is called the quiz book, and consists of questions and answers. The method may be well suited to convey potted knowledge to the student preparing for an examination; it is not necessarily the best way to educate the public in technical matters, though it has the advantage, possibly a doubtful one, that it can be read in snippets and does not make any serious call on the attention of the reader. But within limits the book does manage to convey a large amount of useful information of a practical kind on the hygiene of the teeth. The information generally is on sound lines, though in a book written primarily for an American public the various dietaries advised include certain articles of food unknown here. There are a few pieces of advice which seem to us rather unwise. For example, the question is asked as to what should be the treatment if a child should dislocate a permanent incisor from the mouth. The answer is that the tooth should be picked up, washed in salt water and replaced in the socket. Apart from the risk of tetanus, not entirely negligible, such a tooth should only be replaced by the dentist after the pulp has been removed, the root canal filled, and some more adequate method of disinfection carried out than that recommended.

WHAT IS LIFE?

By AUGUSTA GASKELL. London: Baillière, Tindall and Cox. 1928. Pp. 324. 16*s*.

Mrs. Gaskell proposes that life is a quantity, made up of the same ultimate constituents (electrons) as matter but differing from matter in the manner in which these ultimate units are combined. This quantity varies and forms a series, comprising a very large number of different forms and variations of forms. The quantity life is regarded as identical with soul and mind. An organism consists, therefore, of two systems—material atomic, which is its substance, and immaterial intra-atomic, which is its life. Death is the dissociation of these two systems. As Prof. K. T. Compton and Prof. Raymond Pearl respectively point out in introductions which they have written to the book, Mrs. Gaskell's theory is credible in the sense that it is nowhere grossly discrepant with what are believed to be the assured data of physics and biology. But there is no direct evidence in its favour and its truth fails entirely if it is tested by the modern criterion of fruitfulness; for all that the authoress asserts to the contrary, we judge that it explains nothing and suggests nothing. Nor do we understand how it can be tested by any critical experiments, though Prof. Pearl seems to accept Mrs. Gaskell's claim that this can be done. We cannot advise anyone to spend much time over the book; those who are interested in such problems would do better to read Prof. A. S. Eddington's Gifford Lectures from which Mrs. Gaskell would learn that electrons are not quite the ultimate verities which she seems to think them to be.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 16, 1929

CEREBRAL SURGERY.

IT is well at times to recognise that there are forms of mutual indebtedness between nations which excite no feelings but gratitude. Such are the contributions of each to the common stock of knowledge, and no better example of these could be found than the remarkable development of neurological surgery which the world owes to the United States, and, in particular, to the genius of Dr. HARVEY CUSHING. Many of the fruits of CUSHING'S work during the last 25 years have long been available in his publications and in those of his pupils. There is, however, another aspect of a surgeon's work, and perhaps the most important, which is much less readily communicated to others—his technique. There is no limit to those who can read his papers, but comparatively few are privileged to see him at work and to judge his craftsmanship by the final and inexorable test of its results in his patients. For this reason both surgeons and neurologists will read with great interest Mr. HUGH CAIRNS'S "Study of Intracranial Surgery," [1] which is an account of his year's experience as assistant resident surgeon in Cushing's clinic. During the year which Mr. CAIRNS spent at Boston, 463 cases were admitted to Cushing's clinic, including 369 belonging to the intracranial tumour group. Of these, 229 were subjected to operation, 284 operations being performed. The case-mortality was 12·2 per cent., and the operative mortality 9·8 per cent., all patients who died in hospital being accounted operative deaths. These remarkable figures, which it is safe to say have never been equalled elsewhere, will excite not only admiration but a demand to know how they are achieved, and of this Mr. CAIRNS'S book is an excellent account. His method has been to let "the cases as far as possible tell their own story," and he includes more or less detailed reports of 40 cases, together with a number of radiograms and other illustrations which have been well reproduced. But the book is far more than merely a clinical review, for he has discerned with insight the principles upon which CUSHING'S success is based, and the cases reported are subordinated to the themes which they illustrate.

Mr. CAIRNS first describes CUSHING'S clinical classification of his cases into "verified," "unverified," and "suspect," and gives a brief account of the development of a histological classification of intracranial tumours to which BAILEY has contributed so much. This is work of far-reaching practical importance, as Mr. CAIRNS points out, for it has been possible to a large extent to correlate the histological structure of the gliomas both with their malignancy and with their naked-eye appearances. Hence, in many cases the surgeon can recognise at operation the nature of the tumour with which he is dealing, estimate the prognosis, and plan his operation accordingly. Mr. CAIRNS next draws attention to a change of diagnostic outlook for which CUSHING and his pupils have been largely responsible. Neurological surgery was at first fully occupied with problems of localisation of tumours by physiological and anatomical methods. Radiography, histopathology, and endocrinology have, however, coöperated with the earlier modes of investigation to present many intracranial tumours in a new light as living objects with distinctive life-histories, thus leading to the recognition of the clinical syndromes produced by such tumours as craniopharyngeal pouch cysts, acoustic neuromas, and a number of others. This knowledge, again, is of the utmost value in preparing the surgeon for the problem with which he will be confronted on opening the skull, for modern diagnostic methods teach him not only the anatomical localisation, but in many cases the nature of the neoplasm. Under the heading Methods of Investigation, Mr. CAIRNS naturally considers mainly the more recent advances in diagnostic method, especially the examination of the fundus oculi, the investigation of the visual fields, X ray examination, and ventriculography. These methods are all by now generally familiar, and it will be agreed that the first three should form part of the routine examination of every suspected case of intracranial tumour. Methods of diagnosis, old and new, however, are of no value unless the surgeon is able to deal with the intracranial tumour which he has successfully localised and exposed. For many years technique has lagged behind diagnosis in neurological surgery. We read, therefore, with special interest Mr. CAIRNS'S account of the principles which underlie CUSHING'S surgical methods—namely, (1) avoiding injury to the brain, (2) hæmostasis, and (3) asepsis and closure of the wound. CUSHING'S patient and painstaking surgical technique is well known. Its profound influence upon the whole work of his clinic is perhaps less fully appreciated. Extremely gentle manipulation of the cerebral tissues and absolute hæmostasis are the two factors which, by largely eliminating shock from CUSHING'S operations, have most directly contributed to a reduction of operative mortality. This has had far-reaching results. Not only has it become possible to remove tumours from the brain with little local or general disturbance, but repeated operations in a short period, which in a profoundly shocked patient would have proved fatal, have been rendered practicable. Thus the surgeon has been enabled to deal with such complications as post-operative hæmatoma. Moreover, a low operative mortality-rate justifies early cerebral exploration and so leads to the removal of tumours at an earlier stage of their development than has hitherto been possible. So much for what has already been achieved. Mr. CAIRNS has something to say also about what may be termed the growing point of neurological surgery, the developments of technique which are at present in the experimental stage. Perhaps the most important of these is the application of the high-frequency current to the removal of tumours. By means of the loop electrode it has been possible to remove piecemeal highly vascular and deeply seated tumours with but little hæmorrhage. This development of diathermy and the as yet almost untried effects of radium may well greatly increase the proportion of removable intracranial tumours.

It is interesting to reflect that CUSHING'S success as a neurological surgeon is to a large extent the expression of the peculiar genius of the American people, which may be summed up in the word "technique." The supremacy of technique in American social and industrial life is obvious. Equally the great contributions of the transatlantic peoples to medicine and surgery have been technical advances, such as the growth of micro-chemical methods, the

[1] A Study of Intracranial Surgery. By Hugh Cairns, M.B., F.R.C.S., Medical Research Council, Special Report Series, No. 125. H.M. Stationery Office. 1928. Pp. 83. 3s.

isolation of insulin, and the liver treatment of pernicious anæmia. CUSHING'S contribution to neurological surgery has been the development of its technique in the widest sense of the word, including not only the diagnostic and surgical methods we have already briefly described, but also the technique of organisation, as expressed in team-work and the documentation of cases. England is notoriously suspicious of technical efficiency and likes to pretend that in this attitude lies the secret of her greatness. But this is a cosmopolitan age in which we so readily adopt our neighbours' vices that we cannot afford to neglect their virtues. It is clearly to the patient's interest that CUSHING'S methods should be practised as widely as possible, though it must not be supposed that English neurology has nothing to contribute to neurological surgery. CUSHING has necessarily been preoccupied with practical considerations and has left untouched many questions of more theoretical interest, which may nevertheless have important practical implications. Neurological surgery, in fact, offers a great opportunity for the union of the different but complementary mental qualities of the American and British peoples For in this realm of therapeutics each operation is an experiment in human physiology, and the greater its technical efficiency the greater the scope it provides for the spirit of physiological inquiry which is the basis and peculiar pride of English neurology.

LONDON CHILDREN AND THE FOUNDLING SITE.

ABOUT a year ago the future of the site of Capt. CORAM'S Foundling Hospital was the subject of keen dispute. This terminated abruptly as far as the commercial participants were concerned, when the Foundling Estates Protection Association was able to secure a Parliamentary veto to a proposal to re-erect Covent Garden Market on the coveted site. Since this time the original buildings have been demolished and several other schemes for utilising the site have been put forward. Of these the most interesting is the suggestion that the historical association of this plot of ground with the restoration of health and happiness to poor children should be preserved, and that the best known hospital for children in the British Empire should be transferred from its present inadequate buildings to new ones to be erected on this space. The Ormond-street Hospital for Sick Children has been making determined efforts to secure the site, for its governors realise the drawbacks of the existing hospital which was founded in 1852. Since that date it has been enlarged three times, not by being rebuilt but by piecemeal additions, with the result that the hospital is a patchwork affair. The position cannot be properly met by reconstruction on the present site in Great Ormond-street. The hospital is hemmed in by high buildings, particularly on the south and west, so that adequate sunlight and fresh air are lacking. These topographical and structural defects, together with insufficient accommodation for the nursing staff, for prosecuting research and for isolating and observing infectious cases, materially hinder the staff of the hospital in carrying out their work. Now, however, a unique opportunity presents itself of providing a building worthy of the hospital's great tradition as a centre of pædiatrics.

The question whether hospitals for children—or indeed for adults—are better situated in the centre of the town, or in the country, is irrelevant, for all are agreed that with the present conditions of staffing and transport large central institutions are essential, though they should be supplemented by country branches. It is hoped eventually to provide accommodation for 500 children at the auxiliary hospital at Tadworth, and perhaps in the far future the London beds of every great hospital will not be occupied for long by any individual patient. This would be a foreshadowing of the day when there will be a regular drafting of all patients that can be moved from the London hospitals to their associated county establishment. But the London hospitals will be the great and original focus, and as far as children's hospitals are in question it is a reproach to Great Britain that visitors from such centres as Vienna, Zurich, and Toronto should have to go to Birmingham or Glasgow to find institutions comparable with those in which they work. One has only to visit the Children's Hospital in Toronto, for example, to realise how woefully London lags behind other cities far less wealthy than itself in the matter of a modern children's hospital.

Within the next two or three weeks the sum required for the deposit money to secure this site will have to be obtained. If it is not, one of the most promising opportunities of our time for restoring sick children to health and happiness will have been lost.

ADENOIDS AND ENLARGED TONSILS.

THE cause or causes of enlarged tonsils and adenoids are by no means fully understood, and for the past five years a small committee of the Board of Education has been collecting information about them through the School Medical Service. As will be seen from our summary of their interim report (p. 355) no very remarkable facts have yet been brought to light, but evidence is produced in favour of certain conclusions, and plans have been made for further studies. The investigation covered 640 children, of whom 502 were found to have enlarged or septic tonsils, or adenoids, or both. It will be noticed that the Committee wisely included those cases in which the tonsils, though not enlarged, showed signs of sepsis. These 502 children are classified as "cases," and the remaining 138 are called "controls." The cases are divided as follows: 382 had tonsils and adenoids, 47 adenoids only, and 73 enlarged or septic tonsils without adenoids. From these figures it is seen that in a considerable number of cases enlargement of the tonsils was not associated with adenoids, and the Committee believe that in these the causation was probably different—an opinion contrary to that of most laryngologists, who hold that in children enlarged tonsils without adenoids are decidedly rare. The evidence gathered by the Committee suggested that adenoids are usually established before the age of 5, and that they seldom develop after 8 years, whereas the tonsils may become enlarged at any time during school life. There is a definite tendency for more than one case to occur in a family, but there is nothing to show whether this is the result of some hereditary characteristic or of similar environmental conditions. A poor state of health during the first year of life was far more common among the cases than the controls, and was usually attributable to bronchial catarrh; from the early age at which these catarrhal attacks started, they were probably the precursors rather than the consequence of the adenoids. Again, it seems certain that there is some relationship between the common infectious diseases

nd the onset of adenoids; sometimes the febrile ttack is the immediate existing cause of hyper-rophy of the lymphoid tissue, whilst sometimes, erhaps, the presence of enlarged tonsils or adenoids nakes a child more liable to infection. A far greater roportion of cases than of controls showed definite igns of old rickets, and it is not impossible that a eficiency of the calcifying vitamin which is known o be the essential cause of rickets may have some-hing to do with nasopharyngeal abnormalities. The nvestigation was not concerned with very many ases, and has suffered from the further disadvantage hat the great majority of the children, when first xamined, had already passed the stage of onset. 'he Committee have therefore decided to proceed 'ith the systematic examination of a series of nselected children from birth, so as to ascertain what actors in the early history and condition of these hildren can be related to the onset of enlarged tonsils nd adenoids. They will also examine a large number f unselected children at 5 years of age in order to arn how often adenoids and tonsils are associated ith the bony abnormalities that suggest vitamin eficiency.

HOSPITALS AND THE RATES.

DETAILS of the position of provincial voluntary ospitals in the present alteration of our rating and aluation system are given elsewhere. At the oment many hospitals do not yet know their new ssessments, while, of those who know their fate and ave appealed against it, many have not yet had their ppeals heard. But enough information is available o make it certain that the assessments display a grave ack of uniformity. The Central Valuation Com-nittee was constituted under the Act of 1925 to o-ordinate and advise. It has issued recommenda-ions to local authorities for the very purpose of ttaining uniformity. Yet the recent memorandum f the Central Bureau of Hospital Information discloses he widest variation in the scales adopted. For one ospital the scale on which assessment is based is *s. 6d.* per patient and staff bed; in another it is £5; n another the scale is to be 25 per cent. of the sur-eyor's valuation—a figure which would probably iffer markedly in different localities. There seem o be four different policies possible. The first is to e-rate the hospitals and give them not less privilege n this respect than is enjoyed, for example, by places f worship or Sunday schools under the Acts of 1833 nd 1869, or by certain kinds of municipal property. 'he admitted difficulty of this course is that it is now oo late to add hospitals to the subject-matter of the ating and Valuation (Apportionment) Act of last ear, or to vary the lines of the new local govern-ent legislation now being fixed in almost final form nder pressure of the Parliamentary time-table in a ession of which almost every moment is booked. f this course cannot be attained by public Act, it ay be possible by local Act, as at Glasgow, where all oluntary hospitals are exempt from municipal rates nder a local Act of 1866, and where the Corporation s taking steps to extend the exemption to education, oor, and lunacy rates as well. But local legislation akes time, too, and costs money, and there is no eason why this universal problem should be tackled ocally. The second course is to secure preferential ssessment on the ground that the work of the ospitals saves the rates. Some hospitals which ave a proportion of beds for paying patients favour his second course rather than the first, since they feel t is difficult for them to press for complete de-rating. Here, again, there is a precedent in a local Act; the Halifax Corporation Act of 1920 (10 & 11 Geo. 5., c. lxxvi) allows the infirmary and other local charities to be charged only 10 per cent. of the full assessment charge. The third course is the status quo, mitigated by substantial subscriptions from the local authorities under section 64 of the Public Health Act of 1925, the local bodies thus taking with one hand and giving with the other, but the hospital being left entirely at their mercy and never able to reckon upon a subscription as of right. The fourth course is simply the status quo with no relief whatsoever. If this fourth course is all that the voluntary hospitals have to look forward to, their troubles come at a singularly unfortunate time, when they are threatened with municipal competition. Recent writers—for instance, Dr. Westland Chalmers in his "Hospitals and the State"—surveying the history of hospital organisation and the provision of medical facilities in England, warn us frankly that the ring is being cleared for the final round in the fight between Voluntaryism and State services. Step by step, they say, the development of public medical services and facilities has gone forward irresistibly. The Local Government Bill is a further leap forward. Does the country want to lose its voluntary hospitals? Is it willing to see the burden of the rates used to crush them out of existence?

Annotations.

"Ne quid nimis."

THE KING.

THE official bulletins of the King's health, which appear as usual on another page, bear witness to the successful transfer of His Majesty to his country residence and to the continuance of uneventful progress. Radiological evidence has confirmed the physical examination in showing that the condition of the damaged lung has returned to normal.

IODINE.

IN 1811 a nitre manufacturer in Paris named Courtois, noticing that his vats were becoming corroded, went on to inquire further, and discovered that the copper was combining with some hitherto unknown substance in the alkaline lye of kelp. Two years later, in association with Guy-Lussac, he described the main properties of the new element, iodine, which has since been found to enter in so many ways into the life of man. While the present interest in iodine may centre round its value for preventing or curing goitre, it must not be forgotten that it plays a part in all the metabolic processes of plant and animal life. The vast literature of the subject has been collected and annotated in a recent report [1] by Dr. J. B. Orr and Dr. Isabella Leitch issued by the Medical Research Council. One of the chief difficulties in iodine investigation has been the lack of a method of analysis sufficiently delicate to determine with accuracy the very small amounts of iodine found in plant and animal tissues, but since 1922 the methods introduced by von Fellenberg have opened up new fields of research. In considering the geological distribution, for example, it has been shown that rocks belonging to the same formation from different districts may differ widely in their iodine content. The amount of iodine in soils is larger than that of rocks from which they are derived. This is in part due to the concentrating powers of

[1] Special Report Series, No. 123. H.M. Stationery Office, 1929. *2s. 6d.*

plants, as work at the Rowett Institute at Aberdeen has shown. Heavily cropping the soil tends to deplete it of iodine, and manuring with either dung or artificial fertilisers causes a marked loss of iodine. The amount of iodine in fresh water and in sea water has been the object of much research, but although marine plants are rich in iodine, the common idea that the sea is especially high in iodine content as compared with the land is not supported by facts; the earth's crust and not the sea is "the storehouse of iodine." In this respect it should be noted that in the preparation of salts from natural brines iodine is largely lost, especially in refined salt. In one analysis four different commercial salts were found to contain no iodine at all. A knowledge of this distribution of iodine in nature is important in reference to its occurrence in animal tissues. Diseased tissues, it seems, have a special affinity for iodine, possibly due to a local acidosis in the inflammatory areas.

The effect of iodine on plant growth depends on the dosage used, on the species of the plant, and on the medium to which the iodine is added. There is an optimum dosage which varies from plant to plant to get the best yield in experimental plots. Some plants, especially the beets, are much more tolerant to big doses. This has, of course, a big economic importance, for it has been shown that by iodine-manuring the total sugar yield from beet can be increased by a third. In the metabolism of animals it is very difficult to distinguish between the direct action of iodine and the indirect action through the thyroid secretion. On large animals the effects of iodine on growth appear to give varying experimental results. In three tests at Iowa the administration of potassium iodide was followed by a definite increase in rate of growth, but certain experiments in Aberdeen gave negative results. In children certain tests carried out in goitre areas show improvement in growth, but the very fact that these results occurred in goitre areas suggests that iodine intake was deficient before it was experimentally supplemented. The importance of iodine in development is indicated in the well-known experiments with tadpoles. Metamorphosis in the amphibian depends, under normal conditions, upon the thyroid secretion, and it seems that iodine produces its effects in virtue of the fact that it is an essential constituent of a compound which is normally elaborated in the thyroid. Recent work on the effect of iodine on certain tissues and organs in the normal subject has brought to light some significant facts. Iodine stimulates intestinal movements, and in excessive doses causes diarrhœa. When administered by the mouth potassium iodide causes a rapid rise in the iodine content of the blood, while the effects of iodine on the skin, whether by external application or internal administration in large doses, are well known. These results have possibly more of a therapeutic than a physiological interest; the effects produced by iodine on the sex organs come into both of these categories. It has long been believed that iodine causes injury to the sex glands, but the dosage in most of the recent experiments which appear to support this view is exceedingly high; no injurious effects occur with small or moderate dosage. These facts have a definite importance in relation to the iodine requirements of animals and man. As far as the former are concerned information is meagre. It is comparatively easy to calculate the iodine intake in animals, and this can be shown in certain experiments to vary in a ratio of from 1 to 6 parts per 1000 millions, comparing the iodine intake with the body-weight. Whether this is adequate or not is not known. In the human subject the minimum amount required daily for an adult male is calculated at 15 microgrammes (millionths of a gramme), and for a child about 50 microgrammes. The dosage necessary to prevent goitre is higher, and the lower physiological limit is placed at about 100 microgrammes per day.

The relation of iodine to thyroid secretion and goitre receives close attention in the report. We have concentrated here on some of the other aspects of iodine in agricultural and domestic economy. The importance of mineral balance in dietetics and the part played by iodine in the equilibrium of the animal organism are becoming increasingly recognised. As with vitamins on the organic side, so with iodine on the inorganic side, the infinitely little counts for much.

MINOR LESIONS OF THE FEET.

THE minor lesions of the feet are responsible for such an amount of disability among all classes, and for so much loss of time and inefficiency in many occupations, that the medical practitioner should be sufficiently acquainted with the possibilities of local treatment to know when his patient may be referred to a qualified chiropodist with benefit. Comparatively few members of our profession are aware of the change which is occurring in the practice of chiropody in this country. The chiropodist has in the past been regarded, often with justification, as a quack who, for commercial reasons, usually combined his occupation with that of hairdressing, and it is true that a considerable number of this type of inadequately qualified practitioner still remains. The Incorporated Society of Chiropodists has, however, as its main object the control of the practice of the profession, and aims at placing it upon a strictly ethical basis; the Society has inaugurated schools of chiropody at various centres, each with its attached "Foot Hospital" in which the students acquire their practical training. The courses in these schools reach a high standard and extend over one to two years. The diploma of the Society, by which the fully educated chiropodist may be recognised, is granted both to successful students of the schools and to others on passing a suitable test. To this end a reliable text-book is essential. The third edition of "Practical Chiropody," written by Mr. E. G. V. Runting,[1] has just reached us. Mr. Runting has contributed a useful article on his subject to our columns (THE LANCET, 1927, i., 51), and those who recall its message and desire to learn more details of the type of treatment the chiropodist is capable of carrying out should consult his book. The author has great experience of the subject and has avoided dogmatism where there is room for controversy; the scientific side of chiropody is admittedly in its infancy and it is too early to adopt stereotyped treatments for many pathological conditions of the foot. The chapter upon the standardisation of terms will be found especially useful, the system given being that adopted at the Foot Hospital.

SYNTHETIC CHEMISTRY 1828–1928.

THE centenary of the synthesis of urea by Fr. Wöhler in 1828 was very modestly commemorated by the Biochemical Society at their October meeting held at Cambridge. Sir F. Gowland Hopkins gave an address in which he referred to the very slow appreciation of the importance of the nature of the discovery, either by the leaders of chemical thought at the time or by the writers of text-books in the immediately succeeding period. It is, perhaps, fair to state, as does Gowland Hopkins in the fuller discourse published in the current *Biochemical Journal*, that Wöhler himself, although he refers to the synthesis as "merkwürdig," did not see that he had begun to attack "vitalism." It certainly was noteworthy that an attempt to prepare ammonium cyanate by heating the potassium salt with ammonium carbonate should yield a substance which had been known for about 50 years as an important constituent of urine. In 1836, J. Dumas, who had met Wöhler in Paris three years before, had developed so much insight into the problem of "vitalism" as to write "in my belief there are no substances which in any peculiar sense, are to be called organic. We visualise in organised beings only very slowly working forms of apparatus which act upon materials at the moment of their genesis and thus produce from a very few elements very various organic compounds."

[1] Practical Chiropody. Third edition. By E. G. V. Runting, F.I.S. Ch., Founder and First President of the Incorporated Society of Chiropodists. London: Faber and Gwyer, Ltd. 1928. Pp. 200. 5s.

the present time vast numbers of organic compounds have been synthesised; in fact, the late Raphael Meldola wrote a fairly thick volume of short descriptions of syntheses of such compounds, and since his untimely death in 1916 many more have been added to laboratory arts. It must not, however, be thought that great cause for jubilation exists. Nature does all her organic chemistry within a very small range of temperature and with very mild reagents, with very limited variations of pH. Fusions with alkali, treatment with powerful dehydrating reagents, and sealed tube reactions under pressure are unknown to her. In plain fact, the syntheses of the laboratory are almost invariably performed in a manner which would destroy the apparatus in which Nature works. Furthermore, Nature has retained the secret of optical activity, leaving to Art the perpetual disappointment of synthesising racemic forms only. The great value of syntheses, a value far outweighing the commercial advantages of cheap and pure products, is the great light which a not too violent method of artificial formation throws on the constitution of the substance formed and on its affinities with other bodies. It is true that certain well-known vegetable products, such as alizirin, the colouring matter of madder, and indigo, can now be prepared more cheaply and satisfactorily in chemical works than in the field, but this is largely due to the fact that a new scientific industry has competed with and conquered an old empirical one. It is conceivable that the botanist, the biochemist, and the agriculturist may yet find means whereby the leisurely and cosmically economical methods of Nature may again, and this time successfully, be brought into competition with Art, and synthetic chemistry be directed with even greater vigour to its task of discovering absolutely new compounds, which may be, as many have been, powerful agents against disease or useful in the arts. From the synthesis of urea to that of thyroxin about a century elapsed. What will the next hundred years bring?

GANGLIA.

GANGLIA are frequently seen in any surgical outpatient department, but either they have not been studied so carefully and thoroughly as are other less common lesions or their pathology presents exceptional difficulty. At any rate, numerous speculations have been made concerning their pathology, origin, and nature and discarded from time to time. In an exhaustive study recently published,[1] Dr. Louis Carp and Dr. Arthur Stout point out that a ganglion has been called a "knot of tissue" containing "mucoid flesh" (the Hippocratic description), a retention cyst, a neoplasm or degeneration cyst; it has also been described as due to herniation or rupture of a tendon sheath. They themselves believe that ganglia arise by a mucinous degeneration of the collagenous fibrils in the fibrous tissue of joint capsules and tendon sheaths. They have observed under the microscope tiny areas of degeneration which coalesce to form small cysts. In the walls of these cysts the lumen of the vessels is conspicuously diminished by fibrosis, and it has been suggested by some writers that the constriction of these vessels causes local impairment of nutrition and degeneration of the fibrous tissue of the cysts. Dr. Carp and Dr. Stout, however, consider these changes to be secondary because they have found healthy capillaries passing through areas of degeneration, giving them an adequate supply of blood. They make no attempt to explain the cause of the mucinous degeneration. The wall of a ganglion is composed of fibrous tissue and the cavity is lined by a dense smooth, white membrane also composed of fibrous tissue, but in a condensed form. There is no epithelial lining. The cysts do not necessarily communicate with joints or tendon spaces, but they may do so if the degeneration is severe. There is usually a chief cyst surrounded by numerous accessory cavities. Trauma has been suggested as a predisposing cause, but trauma in the region of the wrist is a common occurrence and ganglia relatively rare. A conspicuous feature in the ætiology of ganglia is their occurrence in females of slight build between the ages of 20 and 40. In old age ganglia are rare. The selection of the best method of treatment is of great practical importance. Serious symptoms are rare, and deformity is usually the reason given by patients who want treatment; but interference with function and weakness do occur, and pain may be present in some cases, especially those in which a nerve is surrounded by the ganglion. Since recurrence is usually due to incomplete removal, any operation to be successful must be extensive and often involves a prolonged and difficult dissection. For this reason, and also because ganglia sometimes disappear spontaneously, Dr. Carp and Dr. Stout consider it desirable to reserve operative treatment for those cases which do not yield to simpler methods. They have had fair success from rupture of the ganglion, either by gradual pressure or by a sudden blow, and also from aspiration of the contents followed by injection of an irritant such as tincture of iodine. Pressure should always be applied for some time after any non-operative treatment. When an operation has to be performed a general anæsthetic should be given. These conclusions are based on the late results of 70 cases, and will confirm the impressions of many surgeons whose experience of the results of operation has not been encouraging.

[1] Surgery, Gynecology, and Obstetrics, 1928, xlvii., 460.

THE MENINGOCOCCUS.

Cerebro-spinal fever is a disease of peculiar interest to the clinician, the sanitarian, and the bacteriologist, all of whom should welcome the publication of Dr. E. G. D. Murray's monograph[1] on the organism which causes it. Of the useful "green books" issued by the Medical Research Council, this is the fifth to deal with the disease. The *Diplococcus intracellularis meningitidis* is an obligatory parasite which has never been found apart from human beings; in normal times it lurks among the population of England in an almost imperceptible form, living in a few noses and throats, generally causing no symptoms, sometimes producing a catarrh and occasionally a frank case of meningitis. Under certain circumstances, the most important of which appears to be the close aggregation of large numbers of susceptible people, the organism rouses up, spreads widely through the exposed population, and causes enough cases of meningitis to constitute an epidemic. These striking epidemiological facts have been already largely elucidated by bacteriological methods which alone have made it possible to identify the carriers, and no doubt their further explanation depends mostly on our knowledge of the organism on the one hand, and the reaction of the body on the other. Dr. Murray has brought together all that is known about the organism; his references to clinical medicine, pathology, and hygiene are only incidental, though his last two chapters—on human infection and on diagnosis—are of immediate sanitary importance. He reviews in order the morphology, physiology, virulence, toxin production, and immunity reactions, and in his closing paragraphs points out how the habitual neglect to study the biology of bacteria for its own sake has sadly hampered progress along purely utilitarian lines. It is impossible to notice all the points of interest which arise—the whole should be read as a coherent tale. Most are of specific moment, but scattered about are many items of wider importance—e.g., the possibility of drying the organism without killing it, and the exaltation of virulence which may be produced quite quickly by growing it in leucocyte extracts.

Dr. Murray's book will be very useful to working bacteriologists, but it will not escape criticism in various directions. It contains no summaries for hurried people, and it is not always easy to make out

[1] Medical Research Council Special Report Series, No. 124. H.M. Stationery Office. Price 3*s* 6*d*. pp. 142.

what Dr. Murray's considered opinion really is—for example, as to what really is the best medium on which to grow the organism. His remarks (p. 56) on virulence are obscure, and it is not clear how his own view differs from the traditional ideas which he misstates and condemns. The whole question of virulence and minimum lethal dose, to which he devotes much attention, seems to be in an unsatisfactory confusion. The fatal dose of dead bacteria may be only 20 times the M.L.D. of live organisms, from which we may judge that the mice injected with live meningococci die of poisoning as much as of infection—an old-fashioned distinction to which Dr. Murray might pay more attention. If as much as 4·0 mg. of moist bacteria are needed to kill a mouse weighing 20·0 g. (equivalent to nearly half an ounce for a man), the experimental conditions cannot be thought of as even remotely approximating to the conditions of natural infections. Small wonder that the author concludes (p. 57) that "the measurements of virulence as a laboratory test must of necessity be a death struggle" in which we hope Dr. Murray will be the survivor.

INHERITED RESISTANCE TO INFECTION.

EVIDENCE has been accumulating during the last few years tending to show that the power of resistance to infection is a factor inherited according to Mendelian laws. Up to the present investigations along these lines have been mainly concerned with the exanthemata and the results have been far from conclusive. Recent investigations on the incidence and severity of tuberculous infection in members of the four blood groups promise to throw more light on the matter. The results of this work were first published in the course of the past year by Z. Swider and N. Kon,[1] and seemed to show clearly that members of Group A (II Moss) were more susceptible to this type of infection than those of the remaining three groups. More recently the same authors, in conjunction with Mlle. M. Mancewiczowna, have studied the matter from another angle.[2] Taking 300 tuberculous patients, they divided these according to the stage of the disease into Turban's three classes. On investigating the blood groups of all these patients they found that, whereas in Groups O and B there was a steady decrease in the percentage from Turban's Class I. to III., in Group A the reverse was the case. Thus while in Groups O and B the percentage in Class I. were respectively 31 and 20, and in Class II. 25 and 16, in Group A the percentages in Class I. was 43 and in Class III. 52. In Group AB the percentages in all Turban's classes remained approximately the same; the figures, however, are necessarily small for this group. The authors regard these figures as showing a failure of resistance to tuberculous infection on the part of members of Group A. On this assumption an unduly high percentage of members of Group A should be found among the graver and a lower percentage among the milder cases of tuberculous infection. Since the mild and early cases are to be found attending dispensaries and the grave and late cases in hospital wards, the percentage of Group A patients should be lower among the former and higher among the latter class. This the authors found to be the case. Among the 300 cases in Group A 39 per cent. were ambulant and 54 per cent. warded in hospital; of Groups O and B, 32 and 20 per cent. respectively were attending dispensaries and 24 and 15 per cent. warded in hospital. Of members of Group AB the numbers warded and ambulant were about equal. The total number of cases investigated is too small to justify final conclusions, but so far as the investigation goes it seems to indicate a lack of resistance to tuberculous infection on the part of members of Group A. The few figures for Group AB suggest that this group, too, does not enjoy the resistance shown by Groups O and B. The implication of a genetic linkage of low immunity to tuberculous infection with the A agglutinogen is clear; confirmation of these results and further investigation as to whether the low immunity is special for tuberculous or general to all types of infection should follow.

[1] Compt. rend. de la Soc. de biol., 1928, xcviii., 385.
[2] Ibid., 1928, xcix., 1023.

THE MONKEY AS FRIEND AND ENEMY OF MAN

AN American advocate has recently argued that the theory of evolution gives the orang-utan a legal status but the learned judge disallowed the plea. The public health status of the anthropoid apes and monkeys has been almost as much neglected as their legal position. Although they are, in fact, our nearest relations, we have been far more friendly—as is so often found amongst relations—with remoter animals. The domesticated species have for long been studied and the diseases that they can convey to man, with or without suffering themselves, are fairly familiar. The Tropical Section of the Royal Society of Medicine remedied this omission last week when it held an inquiry into the danger to man of monkey diseases and infestations.

The obvious grouping for diseases of this kind is those from which both monkeys and man suffer, those peculiar to man but sometimes found accidentally in monkeys, and vice versa; and those which can be experimentally conveyed to monkeys from man although the animal is not naturally subject to them. The outstanding example of the first group is tuberculosis, and there is no doubt that in this case the greater sufferer is the monkey. There is no certain evidence that the animal in the wild state ever contracts the disease, but once it is captured, kept for awhile in the squalid conditions of a coast native hut, and shipped abroad, perhaps under shocking conditions of travel, the human bacillus plays havoc. Only the pathologist who has opened the body of a menagerie monkey can believe the extraordinary degree of dissemination that is seen. Some of the specimens brought from the Zoological Society's prosectorium by Col. A. E. Hamerton illustrated this very vividly. The bovine bacillus is equally virulent although there is less likelihood of exposure to infection. From the public health point of view, the pet monkey constitutes a danger to its owners unless its history from the time of captivity is above suspicion. The danger is increased by the extraordinary fact that a monkey riddled with tuberculosis may appear perfectly healthy until the day of its death. Monkeys in captivity are also susceptible to pneumococci and streptococci, and *B. aertrycke* and Flexner's bacilli have been isolated from the fæces. It is conceivable that they might act as carriers of pneumonia or dysentery if kept in close contact with man, but the risk is obviously not great. It seems probable that they may harbour the histolytic amœba without suffering from acute disease, and trypanosomes apparently identical with *T. gambiense* and *T. rhodesiense* have been found naturally in them. Our knowledge is, however, distinctly vague and uncertain until we come to helminthology. With Dr. T. W. Cameron's recent discovery of *Schistosoma mansoni* in the blood of African monkeys living in St. Kitts, a grave indictment has been brought against the monkey tribe. Bilharziasis is endemic in the West Indies and, so long as the monkeys carry the organism, the disease cannot be eradicated by measures directed against the human hosts alone. Dr. Cameron strongly suspects, also, that African monkeys in their native home carry *Schistosoma hæmatobium* as well as *S. mansoni*, and it would be well worth while for local investigators to confirm this. Whipworms, though common both to man and monkey, probably cause little disease, but the life-history of physaloptera requires further study as it has some local hygienic importance in Africa as it probably infests an intermediate host. The louse is a potential carrier of disease, and the human forms have a peculiar distribution among the great apes and the African spider-monkeys which might prove significant under certain circumstances. India, it must be remembered, has a peculiar problem of her own, since in many parts the langur or grey monkey is regarded as sacred and large numbers of semi-domesticated

acaques, or little brown monkeys, live in close ntact with the people. In India, every monkey sease is a potential danger to man in a way that it nnot be in countries where intimate contact is nfined to a few isolated pets. The general charge ainst the monkeys is, therefore, that they act as servoir hosts, certainly for bilharzia, and possibly r rabies, trichocephalus, and yellow fever.

The defending counsel would be able to put up a ry good case for the value of his client, the monkey, man. The whole tale of our research into and owledge of certain terrible diseases of man depends on the simple fact that they are transmissible to onkeys in the laboratory. Thousands of monkeys ve lost their lives from diseases which they would ver encounter naturally, in order to save mankind m the ravages of poliomyelitis and yellow fever, d even when the disease is one that other laboratory imals will take, the monkey is often preferable cause its illness more closely resembles that of man. of. E. Hindle declares that his work on yellow fever, e good results of which can hardly yet be estimated, as wholly based on the discovery that monkeys could infected. An interesting contribution to scientific owledge is offered by the study of monkey diseases d parasites. Dr. V. B. Wigglesworth pointed out at the distribution of lice has a definite phylogenetic gnificance and Dr. Cameron said the same of elminths. The parasitologist and epidemiologist ve a contribution to make to the study of evolution hich has hitherto been neglected. It may well prove ue also that the study of evolution and animal lationships would throw some light upon the stribution of disease and the lines along which it may expected to attack.

THE MECHANISM OF THYROID SECRETION.

THE results of some researches recently published y R. J. Ludford and W. Cramer[1] shed light on the fferences in the mechanism of secretion of the thyroid and in the normal gland and in exophthalmic goitre. ecent cytological work has shown that the products secretion in the thyroid cells accumulate in relation- ip to the Golgi apparatus which is normally situated etween the nucleus and the alveolar secreting surface the thyroid cell. During secretory activity droplets ppear in contact with the Golgi apparatus and pass it into the cytoplasm towards the lumen of the veolus. The position of the Golgi apparatus, herefore, gives a clue to the direction of the process of cretion. To exclude the possibility of a normal teration in position of the Golgi apparatus Ludford nd Cramer induced long and severe activity in the yroid cells of rats by exposing them to cold in an e-chest, sometimes after epilation. Sections of the yroid of rats so treated, although they showed some vidence of displacement of the Golgi apparatus in a w cells, showed no signs of definite double polarity. is concluded from this that in normal cells, even ter great secretory activity, there is no alteration in ie direction of the discharge of secretion. The osition of the Golgi apparatus was next studied in mouse that had spontaneously developed all the rdinal signs of exophthalmic goitre, and also in ands recovered from human beings with this disease. n the mouse the gland showed a remarkable deviation om the normal structure, especially as regards the olgi apparatus, which often exhibited a complete eversal of polarity, being directed towards the apillaries instead of towards the lumen of the alveolus. loreover, droplets of secretion could be seen in contact ith the Golgi apparatus of these displaced cells, a ndition not observed in normal over-stimulated lls that were a little displaced. A similar state of ings was observed in sections from the thyroid of uman exophthalmic goitre, except that droplets of cretion in contact with the Golgi apparatus were rely seen. The investigators attribute the absence f droplets to the fact that iodine had been given efore operation. They suggest that these findings dicate that in the normal thyroid gland the secretion passes into the alveolar lumen first, even during prolonged activity, and is then passed on into the blood; whereas in exophthalmic goitre the secretion goes directly into the capillaries. Thus the hormone that passes directly into the capillaries in exophthalmic goitre may be chemically different from that which in the normal gland only passes via the alveolus. This would coincide with views previously expressed that exophthalmic goitre is not due to an increased secretion of the thyroid gland, but to a slightly altered hormone.

[1] Proc. Roy. Soc. B., 1928, civ., 28.

THE DOCTOR AS PATIENT.

MUCH has been written about the psychological relation of the patient to his doctor, and the elements of it are well recognised. Its roots lie in that suggestibility which is prominent in the mentality of practically everyone, and which is, moreover, accentuated and focused by sickness until it dominates every other motive. All experienced clinicians know that the "confidence of the patient" may determine the success of the treatment, and the phenomenon has been further illuminated by the modern psychotherapists, whose object from the start is to secure a satisfactory "transference" of the unconscious infantile dependence of the patient to their own personality. What is not so often discussed is the manner in which this relation is modified when the patient is himself—or herself—a doctor. Prof. Theodor Brugsch [1] finds that the all-important element of confidence is practically annihilated. The doctor knows too much. He has reassured too many patients himself, he has too close an acquaintance with their minds and the irrational way in which it pays to deal with them to put any trust whatever in the method when applied to himself—and he assumes a priori that it will be applied to himself. The result is, says Prof. Brugsch, that a sick doctor is never the patient of the colleague who is treating him. He remains his own patient, unless the colleague is very strong-minded and eminent, or the sick doctor is too ill to criticise. The psychological rôles are reversed; the patient is the dominating partner and the physician the dominated, in proportion among other things to their relative ages. Moreover, as every doctor knows, an integral part of the treatment of many patients is the correction of false ideas about their condition. When the patient is a doctor his ideas are rather more erroneous, if anything, than they would be if he were a layman, and they are infinitely more troublesome to over-rule. If the colleague in charge is a younger man to do so may be impossible. Another factor which makes the treatment of a colleague difficult is the extreme reluctance of any doctor to admit that he is ill. The result is that he does not become a patient until he is so bad that he is the worst judge of his own condition, the more so since he had deceived himself about it from the beginning. Nevertheless, the fault is not all on the side of the patient. A great and very general mistake in the doctor who treats a colleague is, according to Prof. Brugsch, the assumption that the sick man must, because he is medical, be regarded as in some way different from an ordinary lay patient. The physician begins by making the cardinal blunder of taking his patient into consultation and treating him as a scientific equal. He assumes that his treatment must for this reason be instantly intelligible and acceptable, while from the nature of things it is most unlikely to be anything of the sort.

The conclusion Prof. Brugsch comes to is rather surprising. He does not suggest a remedy for this state of affairs except that both sides should recognise it and be on the look-out for its manifestations, and that the doctor who becomes ill should, as a doctor, forbear from treating himself but rather take the valuable opportunity of enlarging his knowledge of human nature by observing his own experience as a patient. What Prof. Brugsch does see in the situation is a reason for the almost universal custom of refusing to take a fee for services to a medical colleague.

[1] Deutsche Medizinische Wochenschrift, 1929, lv., 27

THE CHLORINE TREATMENT OF DRINKING WATER.

NASCENT oxygen has proved to be so truculent an enemy of bacterial life that it may come to be regarded as one of mankind's chief aids in his struggle with the lower fungi. The potency of oxygen as elaborated from water by the action of chlorine or its compounds is not determined by its concentration as in the case of mere chemical disinfectants, for the onslaught on bacterial life continues unabated until the last molecule of oxygen has disappeared, while after disinfection is complete there is no poisonous or unpleasant remainder except it may be in the case of certain trade effluents. Hence it is that the use of chlorine for water purification is gaining in popularity every year.

It was at Lincoln in 1905 that Sir Alexander Houston first used an alkaline hypochlorite solution, containing 12 to 14 per cent. of available chlorine, to sanify the drinking water in the face of an emergency created by an epidemic of typhoid. Chlorination was adopted during the late war as an interim measure for London river water and has never been discontinued. Now in many parts of Europe, Asia, and America chlorinators have been installed on a large scale. Quite recently, for instance, the water-supply of Santiago (Chili) has been disinfected with, it seems, an immediate decrease in the rate of infant mortality. In Bogotá (Colombia) typhoid fever diminished rapidly as soon as the aqueduct water was chlorinated. In the United States of America 70 per cent. of the population are supplied with drinking water that has been treated with chlorine. The procedure varies from place to place. In some a minimal amount of chlorine is merely added to the clear and colourless filtered water as a final safeguard against accidental contamination during distribution. In others the chlorine is introduced to the raw water prior to filtration. In yet others a large excess of chlorine is added to destroy algæ as well as bacteria, the excess being subsequently removed by treatment with some other chemical agent such as sulphur dioxide. There has been similar variety as to the form in which the chlorine is presented. On the largest scale chlorine gas compressed into liquid form is the simplest and most effective form of chlorination. In Central and South America, as well as in other countries at a distance from places where liquid chlorine is manufactured, the product resulting from the electrolysis of sea-water has been used as a substitute; while in France resort has naturally been taken to the hypochlorite solution known as *eau de Javel*, which has long been in use as a cheap and harmless disinfectant in the home. On another page Mr. T. H. Bishop describes a simple but very ingenious apparatus for the *javelisation* of drinking water as it is practised in Rheims. This apparatus, as the illustration shows, does not involve the use of anything except the simplest material and a primitive type of installation. Another simple form of apparatus for the same purpose has been recently described [1] by Major E. W. Wade, R.A.M.C., the mother type of all these apparatus being that set out by Houston in the sixteenth annual report of the Metropolitan Water Board.

On active service the conditions are very different, and any feasible method of preparing potable water implies the use of some compound containing positive chlorine which is solid at ordinary temperatures and pressures. Bleaching-powder, however cheap and accessible, has proved too erratic in use as a water disinfectant; chloramine and halazone, which have been tried abroad, act too slowly to be safe in emergency. In a recent number (October, 1928) of the *Military Surgeon* Major Cyrus B. Wood, of the U.S. Army Medical Corps, makes a strong claim for succinchlorimide as a chemical agent for the preparation of potable water. This is a colourless crystalline compound with a slight chlorous odour, a melting-point of 148° C., readily soluble in one hundred parts of water. It seems to possess the qualities of a useful water steriliser—namely, prompt reaction, stability on prolonged storage, and non-toxicity towards the human body. Its stability is such that, on exposure to air and light (other than direct sunshine) at 50 per cent. humidity for 50 days, succinchlorimide only lost 0·78 per cent. of its original chlorine, while halazone lost 1·7 and bleaching-powder 22·8. Major Wood concludes that succinchlorimide is a compound suitable for the preparation of small quantities of potable water.

[1] Jour. R.A.M.C., October, 1928.

AT the Royal College of Physicians of London, Pall Mall East, the Milroy Lectures will be delivered by Dr. J. Graham Forbes on Feb. 26th, 28th, and March 5th; his subject will be Past and Present Diphtheria in England and Wales, with special reference to the London Metropolis. On March 7th, 12th, and 14th Prof. E. B. Verney will give three Goulstonian Lectures on Polyuria. The Lumleian Lectures on March 19th, 21st and 26th will be a Medical Review of the Surgery of the Chest by Dr. R. A. Young. Dr. F. M. R. Walshe will deal on April 30th and May 2nd in his Oliver-Sharpey Lectures with the Physiological Analysis of some clinically observed Disorders of Movement. The Croonian Lectures will be delivered on June 4th, 6th, and 11th by Dr. H. H. Dale, F.R.S., who has chosen as his subject Some Chemical Factors in the Control of the Circulation. The time in every case is 5 P.M., and any member of the medical profession will be admitted on presentation of a visiting card.

Lord Beaverbrook's recent gift of £22,800 for medical education has been allocated by the Prime Minister to the following institutions: The Royal Society of Medicine, £2800; the Royal College of Physicians, the Royal College of Surgeons, the Medical Faculties of the Universities of Oxford, Cambridge, London, Durham, Manchester, Birmingham, Liverpool, Leeds, Sheffield, Bristol, St. Andrew's, Glasgow, Aberdeen, Edinburgh, and Wales, the Cancer Hospital, Epsom College, and Queen Charlotte's Hospital National Mother-Saving Campaign, £1000 each. The grant to be applied for special purposes beyond the capacity of the ordinary income of the institution—e.g., on studentships, research, or contributions to scientific equipment.

Two anonymous donors have each given a gramme of radium to the London Hospital. One of them, who previously gave £50,000 to endow the hospital's Freedom Research Fund, has also given a further £13,000 to establish and maintain a laboratory for the production of radon, this work being carried out under the name of the Freedom Radium Fund. The cost of one gramme is about £12,000.

THE Royal Free Hospital, London, has received from its chairman, Mr. Albert Levy, the sum of £50,000 as a contribution to the fund for rebuilding the hospital's maternity department, and for research into the causes of maternal mortality and of invalidity.

CUMBERLAND COUNTY HOSPITAL.—The new out-patients' wing of the Cumberland County Hospital was opened on Feb. 7th by Mr. Theodore Carr, on the occasion of the centenary of the foundation of the institution. The new wing cost £33,000, and is part of a general scheme costing £70,000.

SUSSEX PROVIDENT SCHEME.—The prediction made in 1921, when the late Dr. J. F. Gordon Dill launched this scheme for hospital and specialised medical services, that in a very few years it would benefit the hospitals to the extent of £10,000 a year, has been more than fulfilled. In 1928 the coöperating hospitals received no less a sum than £11,142. The largest payment during that year was £4286 to the Royal Sussex County Hospital, Brighton, whilst the Royal Alexandra Hospital for Sick Children received £1628, and the New Sussex Hospital for Women and Children £1260. The sum of £850 was paid to the Hove Hospital, and three other institutions received over £500 each.

The Clinical Interpretation of Aids to Diagnosis.

Series of Special Articles contributed by Invitation.

XII.—THE CLINICAL SIGNIFICANCE OF THE BLOOD-UREA CONTENT.

THE estimation of the blood-urea has become a commonplace of ward work with the advent of methods which permit the utilisation of small quantities of blood but yield accurate results. It has indeed long been recognised that urea accumulates in the blood in certain types of renal disease, but the large quantity of blood needed and the labour involved militated against the use of routine estimations of the blood-urea in clinical medicine. It is not proposed to discuss in detail the numerous methods of urea estimation which are now employed, but it may be mentioned that they are of two main types. In the first, which was used by Widal in his classic work on renal disease, hypobromite is added to the deproteinised blood and the nitrogen evolved is estimated: in the second, which we owe to Marshall, Folin, and Van Slyke, the urea is decomposed either by the ferment urease or by the autoclave, and the ammonia formed estimated colorimetrically after Nesslerisation or by volumetric titration after distillation into acid.

The Normal Blood-urea.

Before considering the clinical significance of the urea content of the blood, it is necessary to form some idea of the factors which in health maintain it at a fairly constant level. We have on the one side the formation of urea in the katabolism of proteins; on the other, the excretion of urea by the kidneys. The blood-urea content represents a balance between these two activities. Let us first consider the activity of the kidney.

No evidence has been adduced which suggests that urea is treated by the kidney as a threshold substance. While such useful bodies as sugar or sodium chloride are conserved, and not excreted by the kidney unless their concentration in the blood exceeds a certain threshold value, urea is, from the kidney standpoint, a purely waste body to be excreted however low the blood-urea content. It is not, apparently, a function of the kidney to maintain the blood level at a "normal" level. Since, however, the rate of excretion of urea tends to bear a direct relationship to the concentration of urea in the blood, with a healthy kidney and an average diet, the blood-urea content tends to remain within certain definite limits. A further point of great practical importance is that adequate water must be available for excretion if the blood-urea is to be kept within these limits. If, for instance, we assume that 30 grammes of urea are being formed in the body daily, and that the kidney can concentrate urea in the urine to the high figure of 5 per cent., it is obvious that 600 c.cm. (20 oz.) of urine at least must be excreted per diem if a balance is to be struck between urea formation and excretion. If less water than this is available, urea will accumulate in the body and the blood-urea will rise.

The effect of the diet on the blood-urea is not of any great importance from the point of view of the clinician. It is true that, even in healthy persons, by raising or lowering the protein intake the blood level may be raised to a level of 50 mg. or dropped to as low a figure as 12 mg. per 100 c.cm., but such variations are not seen on anything approaching an average diet. The only variation commonly met with, which may reasonably be attributed to an alteration in the amount of urea formed in the body, is the low blood-urea of the later months of pregnancy. The blood-urea of the pregnant woman may fall to as low a level as 10 mg. per 100 c.cm., probably owing to the demands of the growing fœtus on the protein of the maternal diet. The above points have merely been emphasised in order to draw attention to the fact that causes outside the kidney may lead to alterations in the blood-urea content. One further important consideration must be mentioned—the large factor of safety in the renal tissue available. So large is the excess of kidney substance over the necessary minimum that one kidney suffices to ensure adequate urea excretion. The blood-urea does not therefore rise after a unilateral nephrectomy.

In hospital patients on an ordinary ward diet the blood-urea content will usually be found to lie between 20 and 40 mg. per 100 c.cm (0·02 to 0·04 per cent.); in strictly healthy young adults in a fasting state between 20 to 30 mg. For our purpose we may regard any figures over 40 mg. as excessive.

Uses of the Blood-urea Estimation in Clinical Work.

Blood-urea estimations are employed by the clinician in the diagnosis and prognosis of nephritis in the examination of patients suffering from surgical affections of the urinary tract, and, lastly, in the diagnosis of uræmia from other conditions. Under this last heading we have to consider possible extra-renal causes of urea retention. Let us first discuss the question of nephritis, assuming that our patient shows symptoms suggestive of that disease, and that his urine contains albumin and casts. Under such conditions any urea accumulation found may fairly be attributed to renal inadequacy.

The Blood-urea in Nephritis.

The two main types of renal inadequacy were first differentiated by Widal, and are too well known to need elaboration here. Suffice it to say that in the first, or azotæmic, retention of urea and other waste nitrogenous bodies is present, while in the second, or hydræmic, water retention, without appreciable accumulation of urea in the blood, is the main feature of the disease. We are concerned here with the first of these two forms of renal failure, but it may be mentioned that in the hydræmic patient a moderate increase in the blood urea, to such a figure as 50 mg., may be found. Such accumulations are merely the result of the oliguria, the concentrating power of the kidney remaining intact and the percentage of urea in the urine high. The azotæmic form of renal inadequacy on the other hand is characterised by an absolute inability to excrete a concentrated urine. The main forms of renal disease in which this inability to concentrate and excrete urea is present are chronic interstitial nephritis, acute and subacute glomerulo-nephritis, pyelonephritis, and polycystic kidney. In assessing the significance of any blood-urea figures found, it is, in the first place, absolutely essential to arrive at an idea of the type of disease present. In interstitial nephritis and polycystic kidney we are dealing with steadily but slowly progressive lesions, in acute glomerulonephritis with a disease in which very rapid changes for better or for worse are possible, and in pyelonephritis with a lesion capable of rapid extension. It is in the relatively stable conditions first mentioned that the estimation of the blood-urea is of most value. The laboratory worker, if asked for his opinion as to the significance of the figures found, is entitled to all available information as to the pathological condition present.

In drawing conclusions from the blood-urea content in cases of acute glomerulonephritis certain considerations must be kept in mind. In the first place, extreme oliguria is usually present, and the rise in the blood-urea may be due as much to inadequate water excretion as to impaired concentrating capacity. Secondly, rapid improvement and a sudden diuresis may set in at any time. As a result, prognosis based on the blood-urea content is far from certain. It is in this disease, especially in childhood, when extraordinary reparative capacity is present, that we see the highest blood-urea accumulations followed by recovery. As a rule, a blood-urea content above 300 mg. indicates a

fatal result, but recovery may occur even though a level of 400 mg. has been reached.

It is in interstitial nephritis and in the polycystic kidney that the blood-urea estimation finds its most valuable clinical application. Polyuria is the rule in these conditions, urea excretion is not therefore hampered by inadequate passage of water, and the blood-urea gives a true picture of the state of the renal function. The presence of albumin and casts in the urine of a middle-aged man, associated with a raised blood pressure, does not necessarily imply gross functional damage to the kidney. It is not unusual to see cases of hypertension in which dyspnœa and œdema, actually cardiac in origin, have been attributed to renal failure and regarded too pessimistically, while one also frequently meets with patients in whom, owing to absence of blood analysis, symptoms have been misinterpreted which should have served to indicate the imminence of a fatal uræmia. Lastly, chronic interstitial nephritis is a disease in which the renal function tends to slowly and steadily deteriorate, and in which the course, apart from certain accidents, can be fairly accurately prognosed. The rules of prognosis, laid down by Widal for these cases, seem to me to be still valid. With a blood-urea above 100 mg. life is rarely prolonged for more than two years, with a blood-urea above 200 mg. death may be expected within six months, while minor accumulations up to 100 mg. are of no prognostic significance. It is advisable to base one's decision on two estimations, made at intervals of about a month, if one wishes to avoid mistakes due to temporary exacerbations, and to form some idea of the rate of progress of the disease.

Retention of Other Nitrogenous Waste Bodies in Renal Disease.

Creatinine.—In estimating urea we are not estimating a body which is in itself toxic and which will infallibly kill our patient when it reaches a certain level in the blood. We are merely using the accumulation of a waste product in the blood as a measure of the degree of renal inadequacy. Now, since the amount of urea formed varies with the protein content of the diet, the load of urea presented to the damaged kidney for excretion is very far from being a fixed quantity in different individuals or in the same individual from day to day. Of all the nitrogenous waste bodies present in the urine, creatinine shows the most constant daily excretion on a creatinine-free diet. The blood creatinine content has therefore been suggested as a more satisfactory index to the degree of renal inadequacy present than the urea content. Creatinine accumulates in the same types of renal disease as does urea and has been found to possess a very considerable prognostic significance. A creatinine content in excess of 5 mg. (normal 1·2 to 1·5 mg.) indicates in chronic nephritis that death will take place within a year.

Uric Acid.—For the third nitrogenous waste body, uric acid, a different significance is claimed. It, too, accumulates in the blood of the interstitial nephritic, and it is contended that of these bodies it is the one which is concentrated by the kidney from blood to urine with most difficulty. According to some authors, therefore, uric acid will tend to bank up in the blood at a stage of the disease at which urea is still satisfactorily excreted, and an excess of uric acid will be the first indication of renal failure. Actually it would seem doubtful whether estimations of these two bodies add appreciably to the information which may be derived from the simpler blood-urea determination.

The Blood-urea in Urinary Surgery.

Since one intact kidney amply suffices to keep the blood-urea within normal limits, it follows that an increase in the blood-urea above the normal figure indicates an affection involving both kidneys. This rule finds a certain surgical application in renal tuberculosis or calculous pyelitis, but the relative efficiency of the two kidneys is more satisfactorily studied by ureteric catheterisation after administering a dose of 15 grammes of urea. Under these conditions a urinary urea concentration of 2 per cent. and upwards during the second hour may be taken as indicating an adequate efficiency in the secreting kidney.

The blood-urea examination is of more value in prostatic disease in which any renal damage present is bilateral. In the prostatic case we have two main renal conditions to consider; in the first place, the interstitial nephritis which follows long-continued obstruction, in the second, pyelonephritis. Of the possibility of the sudden onset of the latter, blood-urea estimations can, of course, give us no warning though they may indicate the existence of the former. It is generally accepted that with a blood-urea above 50 mg. the state of the kidney is such as to indicate caution in surgical interference, that is, a two-stage operation. Further estimations after the first stage will indicate any renal improvement and the time at which removal of the prostate may be undertaken.

Extrarenal Causes of Urea Retention.

Up to this point we have dealt with accumulations of urea in the blood of patients in whom the diagnosis is established. We have assumed that the patient suffers from some renal lesion in which failure of urea excretion is known to occur and have tried to assess the value of the findings as a guide to prognosis or treatment. Let us now consider the case of the patient in whom the diagnosis is in doubt and in whom a blood-urea estimation has been made as part of the routine examination. Let us suppose that the blood-urea content has been found to be above 100 mg. per 100 c.cm. Are we at once to assume that we are dealing with a case of serious renal impairment, and to plan treatment accordingly? The answer is emphatically in the negative, since in several conditions which may clinically suggest uræmia a high blood-urea may be met with though actually the kidneys are intact. We may, for instance, be called to a patient in middle life suffering from incessant vomiting with a trace of albumin in the urine. We find this blood-urea content to be 100 mg. per 100 c.cm. and diagnose uræmia, only to discover later that he is actually suffering from intestinal obstruction.

Desiccation Urea Retention.—There are, in fact, a whole series of conditions in which inadequate water is available for excretion of urea and in which the blood urea reaches a high level as the result, even though no renal lesion is present. The rise in the blood-urea is favoured by the fact that desiccation in itself leads to excess in katabolism of protein and to excessive urea function. The unfortunate kidney is thus faced with an added demand on its excretory functions at the very time at which it is least able to meet it owing to an inadequate supply of water for excretion. Among instances of such "desiccation," urea retention one may mention intestinal obstruction, general peritonitis, diabetic coma, gastro-enteritis in childhood and cholera. Very high blood-urea contents may also be seen in comatose patients whose fluid supply has been inadequate.

Though at first sight it might seem that such accumulations must lead to hopeless confusion, this is not actually the case. Retention of urea due to actual renal lesions is always accompanied by inability of the kidney to concentrate. In the "desiccation" retentions the concentrating faculty remains good and if a specimen of the urine is obtained it will be found to show a urea concentration of 3 per cent. and upwards. By a simple hypobromite estimation of the urinary urea we can therefore pick out this group from the true uræmics. The indication is, of course, to to supply fluid by any possible route, since in addition to urea other waste bodies are retained and an acidosis similar to that of uræmia develops. Similar but smaller accumulations may be met with in cardiac disease with decompensation and oliguria—such figures as 50 to 60 mg. being not uncommon.

In cases, therefore, in which the blood-urea has been estimated as a diagnostic procedure and found to be above the normal upper limit of 40 mg., it is advisable

t to be content with this finding alone, but to ntrol the conclusions drawn from it by an estimation the concentration of urea in the patient's urine. It hardly necessary to add that the ordinary clinical amination for albumin, casts, &c., must not be nitted. In the presence of a high blood-urea and a w urinary urea concentration, the physician may st assured that he is dealing with true renal adequacy. If these considerations are borne in nd, the blood-urea estimation is as valuable an aid the diagnosis of certain obscure cases as it is the prognosis of chronic nephritis.

O. L. V. DE WESSELOW, B.M. Oxf.,
F.R.C.P. Lond.,
Physician with Charge of Out-patients, and Chemical Pathologist, St. Thomas's Hospital.

Special Articles.

ADENOIDS AND ENLARGED TONSILS.

INTERIM REPORT BY THE BOARD OF EDUCATION'S MEDICAL COMMITTEE.

IN 1924 Sir George Newman arranged for four mall medical committees, consisting of officers of e medical branch of the Board of Education with nical experts and representative school medical ficers, to consider four subjects requiring further vestigation in order to enable the Board and the edical officers of the local education authorities to rform their duties more effectually. The committees were to be of an informal nature and form rt of the scheme for "field" research into those pects of the work of the school medical service cluding the abnormal child) on which knowledge is inadequate. The subjects to be dealt with by is means were (*a*) the prevention of adenoids and larged tonsils, (*b*) the prevention of defective vision d squint, (*d*) an anthropometric survey of a large oup of children of school age, and (*d*) the problems esented by the mentally defective child.

The Committee and its Reference.

The first of these committees, which has now esented an interim report,[1] consisted of Sir George ewman, chairman; Dr. R. H. Crowley (Board of ducation), vice-chairman; Dr. D. Forsyth (physician, aring Cross Hospital); Mr. H. Bell Tawse (aural rgeon, Nottingham Education Committee); Dr. J. Thomas (senior medical officer, L.C.C.); Mr. . Tilley (surgeon to ear and throat department, niversity College Hospital); Dr. A. Warner (school edical officer, Leicester); with Dr. H. C. T. Langdon Board of Education), secretary. This committee was ked to inquire into the incidence of, and physical d environmental conditions associated with, enlarged nsils and adenoids, and into the methods and results treatment.

The Ætiological Problem.

The Committee's investigation revealed no dramatic fference in the social circumstances or environment children suffering from enlarged tonsils and adenoids compared with other children. The evidence so r accumulated suggests that the ætiological problem similar in some respects to that of dental disease, that both conditions affect all classes of society ithout any conspicuous difference in incidence; at there is a definite tendency for certain families be affected; and that the cause in a considerable mber of cases obviously begins to act in antenatal early postnatal life. The report adds that the equent association of these two conditions suggests ther that the one affects the other, or that there is common cause, or both.

[1] Board of Education. Interim Report of the Medical ommittee on Adenoids and Enlarged Tonsils. H.M. tationery Office. 1929. 6*d*.

The antenatal and early postnatal history of these cases indicates that they start life with a slight but perceptible handicap. Prematurity, artificial feeding, defects of environment are slightly but consistently commoner than among normal children. The onset of adenoids appears to be preceded by catarrhal affections of the nasal passages. These attacks may be due to an abnormal susceptibility of the mucous membranes during the first years of life, the result perhaps of a lowered vitality, the causes of which have not yet been made clear. Alternatively they may follow a chance infection of normal mucous membranes, a possibility indicated by the very considerable proportion of cases in which an attack of infectious disease is the immediate precursor of adenoids. The apparent association of enlarged tonsils and adenoids with rickets suggests the possibility that a deficiency of the calcifying vitamin D may play some part in the ætiology of this condition. This is a matter which in the opinion of the Committee deserves careful investigation.

There are two lines of investigation which should go far in the Committee's opinion towards settling this matter. One, carefully controlled, should be carried out on similar lines to that already done by Dr. G. C. M. M'Gonigle, in order to check his results, and to determine whether the slighter signs of rickets are generally present with enlarged tonsils and adenoids; the other should be directed to ascertaining whether an adequate supply of the calcifying vitamin from the earliest years of life tends to prevent the onset of adenoids. An investigation on these lines having reference to the origin of dental disease is actually in progress at certain institutions in Birmingham under the auspices of the Medical Research Council, certain groups of children being supplied regularly with an additional amount of the calcifying vitamin, while others similarly circumstanced remain on the standard diet.

The fact is emphasised that adenoids may occur as early as the first year of life, that they seldom develop after the eighth year, and in the majority of cases are already established by the fifth year. The investigation as hitherto conducted has suffered from the disadvantage that the great majority of the children when first examined had already passed the age of onset; there were thus only a small number in whom it was possible to watch the early development of the condition. Moreover, with these children it has been necessary to rely upon the uncertain memory of parents for information of the highest importance concerning the diet, habits, and ailments of the children. For the proper study of the antecedent signs and symptoms it would be necessary to recommence at an earlier age—in fact to follow up a series of children from birth. Such an investigation would most easily be conducted at infant welfare centres, where the child's history could be recorded from month to month; only by such means can it be hoped to obtain reliable information as to feeding, ailments, habits, environment, and dental condition. In any such future inquiry it should be realised from the outset that enlarged tonsils may exist independently of adenoids (some of these cases showing little or no special tendency to develop adenoids) and equally that adenoids may occur unassociated with tonsils. Dissimilar causes may therefore be responsible for the two conditions.

Relationship to Dental Disease.

A definite relationship appears in the light of the Committee's investigation to exist between dental disease and the presence of enlarged tonsils and adenoids, but the nature of this relationship has not so far been established. It is conceivable either that the presence of septic teeth is a factor in the production of tonsils and adenoids, or that the mouth-breathing of adenoids predisposes to dental decay, or that both conditions have a common origin. Some light would be thrown on this question by the careful observation (*a*) of the effect of complete dental treatment on the tonsils and adenoids, and (*b*) of the effect on the dental

condition of removing the tonsils or adenoids. The Committee suggest that both these investigations could be carried out by school medical officers and school dentists without any greater difficulty than is involved in careful observation and recording. A delay of a few months before operating in order to test the value of dental treatment might possibly lead to important results.

Spontaneous Cure or Operation?

The after-history of the cases under review shows a tendency to spontaneous cure of a limited number, and that the cure, when it takes place, may provide as favourable a change in the general condition as is effected by operation. Nevertheless, in the experience of the Committee, the great majority persist unchanged for a considerable period, if indeed they do not get worse. Educational retardation is a fairly common result of adenoids, especially in the higher age-groups. The cause in a certain number of cases is the defective hearing which so often accompanies this condition; in others there is a certain mental lethargy which may be due to some interference with the cerebral circulation. Whether intelligence as measured by the usual tests is actually lower than normal does not seem to have been determined. This is a point worth investigating, particularly by a series of such tests to ascertain whether any improvement in the intelligence quotient results from the removal of the adenoids.

The immediate results of operation are shown to be favourable in the great majority of cases, but less so in regard to aural symptoms than to those of the nasopharynx. There is a small amount of evidence which suggests that the improvement in some children is not maintained. The Committee consider that some further inquiry should be pursued to determine whether this is in fact the case, and if so what are the probable causes. The question of recrudescence of adenoids after operation has not come within the scope of this investigation.

Two Further Investigations.

The Committee's report closes with an announcement of their decision to proceed with further investigations on the following lines: (1) The systematic examination of a series of unselected children from birth, in order to ascertain the facts in the early history and condition of these children which are associated with the onset of enlarged tonsils and adenoids. The examinations will include detailed inquiry into the maternal history during pregnancy and the dietary of the child during its early life, as well as a careful record of the dental condition, including the period of eruption, structure and arrangement of the teeth, the occurrence of caries, and the condition as regards oral sepsis. Any signs suggestive of rickets will be carefully noted. (2) The examination of a large number of unselected children at 5 years of age in order to ascertain the frequency of association of certain bony abnormalities suggestive of vitamin deficiency, with enlarged tonsils and adenoids.

MEDICINE AND THE LAW.

Certification Without Attendance.

AT an inquest at Walthamstow a fortnight ago upon a boy, aged 10, who had died from diphtheria, it appeared that a woman doctor had, on statements from the boy's mother and without personally seeing the boy, certified that he was suffering from influenza and unable to attend school. Questioned by the coroner, the doctor stated that she had not done such a thing in any other case, and did so here only because the mother was in such difficulties. It further appeared that the doctor had, again on the mother's statements and without seeing the boy, prescribed a tonic for him. In the course of recording a verdict in accordance with the medical evidence, the coroner remarked on the procedure by which anyone could seemingly go to a doctor and obtain an indefinite medicine called a tonic without the actual patient being seen; the consequence was, he said, in this particular case, that the mother assumed that the doctor had undertaken the treatment of the child; the child had remained at home seriously ill and a source of infection, and had gradually become worse and died.

Comments by coroners upon doctors obtain such prominence and publicity that it may sometimes be necessary to remember that the doctor has not always either received notice of impending criticisms or been allowed an adequate opportunity of reply; occasionally, too, the matter which gives rise to the comments is something rather remote from the actual cause of death which the inquest is investigating. Subject, however, to these cautious reservations, the incident would seem to invite attention to the necessity of strict care in the giving of certificates. The General Medical Council's "Warning Notice," it will be recalled, observes that any registered medical practitioner shown to have signed a certificate which is "untrue, misleading, or improper," is liable to have his name erased from the Medical Register. A certificate to excuse a child's absence from school is not one of the most important of documents, and agitated parents may by their importunity harass busy practitioners; but the whole profession suffers when a coroner has an opportunity to find fault as at Walthamstow. The wide powers of certification which the profession is allowed cannot be defended if carelessly applied.

Neurasthenia and Workmen's Compensation.

The legal relation of neurasthenia to personal injury is one of the most awkward questions for a judge, especially when he cannot transfer to a jury the task of assessing the financial consequences. In a recent Bristol case the county court judge made it clear that he had been guided largely by the opinion of his medical assessor. The applicant, a married woman, aged 63, with four children, had for a long time been in a position as domestic servant. One day she fell from some steps, the physical damage being slight but the mental result considerable. For some two months she received compensation at the rate of 15*s.* 9*d.* a week; then a medical certificate was given to the effect that the incapacity had ceased to be due to the fall from the steps and was now attributable to the recurrence of a previous nervous breakdown. The applicant claimed her condition was due to the accident; witnesses gave evidence that she had always suffered with her nerves but had not actually had a nervous breakdown before; it was said that she was worse since the accident, and had naturally worried herself over the termination of her award. A medical witness for the applicant said that, although work might take her mind off her worries, she was not fit to do work involving mental concentration. For the employer it was said, on the other hand, that the woman's state was a distinct type of neurasthenia not caused by her fall from the steps. The judge held that her condition was the result of the accident but that she was not wholly incapacitated. He estimated her to be capable of doing at least two half-days' work a week (with an earning value of 5*s.*), and awarded compensation (with costs) on the basis of such partial incapacity. These, of course, are cases in which there is more fact than law to decide, but they are none the easier on that account.

KING'S COLLEGE HOSPITAL.—On Thursday last week Princess Marie Louise, acting for the Duchess of York, opened the Wigram Ward for children at this hospital and received purses for the endowment of one of its cots named after Princess Elizabeth. Sir Lenthal Cheatle, chairman of the Medical Board, stated that this is the first time that a ward has been founded devoted entirely to children needing surgical treatment. The ward contains 24 beds, all of which are full. Nearly one-half of them are given up to throat cases, which will obviate sending patients home immediately after operation on the tonsils. The ward formerly available for children will now be used for medical cases only.

HOSPITALS AND THE RATES.

PRESENT POSITION OF PROVINCIAL VOLUNTARY HOSPITALS.

A MEMORANDUM [1] issued by the Central Bureau of ospital Information owes its origin to inquiries from ıe chairmen and secretaries of hospitals regarding the ɔsition generally with reference to assessments now ɛing made under the Rating and Valuation Act, 1925, ıd the prospect of any action of a joint character ɛing taken. A questionaire was sent out on ov. 28th, 1928, to 679 provincial hospitals in England ıd Wales. By Dec. 31st replies were received from 21 hospitals, containing 18,339 beds (45 per cent. the total). In a large number of places the figures the revised assessment have not yet been determined ıd many hospitals hesitate to express a decided ɔinion with regard to joint action until they know :actly what their own position might be.

The summarised replies provide a basis large enough justify an attempt to form estimates regarding the),285 beds in the English and Welsh provincial ɔspitals. These are: (1) That the English and 'elsh provincial hospitals prior to revision were ıssessed at £63,000, or £1·56 per patient bed. (2) That ıe revised assessments of these hospitals under the ct of 1925 will amount to £95,000, or £2·36 per ıtient bed. (3) That these hospitals which, prior to vision, paid £44,000 annually in rates will, after vision, be called upon to pay £66,000. (In a atement issued by the Ministry of Health it is timated that the average amount of local rates vied for the year 1927–28 was 13*s.* 8¼*d.* in the £ of ıssessable value.)

The views of the 221 hospitals regarding joint :tion are set forth in the following summary :—

	Number reviewed.	
	Hospitals.	Beds for patients and percentage of total.
ɔspitals in favour of joint action with a view to obtaining de-rating ..	107	9,567 (52·17)
ɔspitals in favour of joint action with a view to obtaining assessment on a preferential and uniform basis	60	4,623 (25·17)
ɔspitals which did not express any opinion on the subject	51	3,947 (21·52)
ɔspitals which definitely oppose joint action ..	3	202 (1·10)
	221	18,339

The financial effect of de-rating would be to relieve ıe provincial voluntary hospitals of an annual ayment of approximately £66,000. With regard to ıe financial effect of assessment upon a preferential ıd uniform basis, an examination of the tables ıggests that if the hospitals therein detailed can be ɔnsidered as a representative portion of the whole, ıses of 5*s.*, 10*s.*, and £1 per patient bed would ıcrease the rates payable as follows :—

nount of assessment per patient bed.	Percentage of hospitals where an increased amount would be payable for rates.	Percentage of total number of beds in the provincial voluntary hospitals.
5*s.*	6	4
10*s.*	13	8
£1	19	12

The memorandum is signed by Mr. R. H. P. Orde irector) and Mr. F. C. Davies (secretary), who ɔnclude with the remark that the available data ırdly justify further deduction than they have made.

[1] Memorandum No. 6, obtainable from the Secretary of the ıreau, 19, Berkeley-street, London, W.1. Single copies, . post free. 12 copies, 2*s.* 6*d.*

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Influenza in Berlin.

THE pandemic of influenza which has now reached Berlin is apparently of a benign character, although lately more cases complicated with pneumonia have been reported. The epidemic began as early as December, 1928, but in the first few days of this year there was an explosive increase. On Jan. 4th, 1409 cases were notified to the Berlin general sick-club, which has about 500,000 members. There was at first some difficulty in finding room for the patients, as the hospitals were soon overcrowded, but the Municipal Health Office took the necessary measures. They lent from the Red Cross department 13 barracks with 200 beds, and 46 transportable huts held in reserve for special emergencies were taken into use; the new St. Joseph Hospital belonging to the Roman Catholic Order of the Grey Sisters, which was not to have been opened for several weeks, was made ready by working day and night, and its 600 beds were soon occupied. Some schools where a great number of pupils were ill had to be closed, and the school-rooms adapted as temporary hospitals. A drawback was that a large number of the nursing staff had caught the disease, so that a deficiency of nurses arose. The Health Office has appealed to retired nurses and voluntary Red Cross sisters to do temporary service in the hospitals, and the staff has been replenished in this way. The daily average number of new cases has not increased for some days, but remains at the same level. Children seem to be more liable to catch the disease this year than in former epidemics.

Foreign Guests of the Berlin Medical Society.

Two foreign guests, Prof. Claude Regaud from Paris and Dr. R. G. Canti from London, read papers before the Berlin Medical Society on the cancer question. Prof. Regaud gave in excellent German a report of the success obtained by radium treatment. He explained the different methods of radium administration, especially the method where needles impregnated with radio-active substance are placed round or into a malignant growth and left there for six to eight days. In cancer of the skin he attaches the radio-active tubes by means of a plastic wax mask, adapted to the respective part of the body. These masks are borne by the patients for some days without doing any harm. The results are excellent. In Prof. Regaud's hands 80 out of 344 patients with cancer of the tongue—i.e., 23 per cent.—were definitely cured; in 20 per cent. recurrence took place in neighbouring glands, and in 20 per cent. the treatment was ineffective. In cancer of the lips the results were still more favourable, as a cure was obtained in 90 per cent. of operable cases, whilst of 28 inoperable cases four were restored to health. In cancer of the cervix uteri the number of cures has increased from year to year. Dr. R. G. Canti, of St. Bartholomew's Hospital, London, showed his cinematographic demonstration of living cells, normal and malignant, cultivated in vitro, and of the action of radium on their growth. After the meeting the guests were entertained at a banquet which was attended by many members of the society and of the German Cancer Committee, and by representatives of the Health Office.

Gymnastics for School-children.

Dr. Schlesinger recently described to the Frankfort Medical Society researches on the influence of gymnastics on the physiological functions of school-children. 300 boys and girls from 10–17 years of age were examined before and after a gymnastic lesson. It was stated that in one-quarter of the boys and in one-sixth of the girls a marked increase of the dynamometric index was obtained, a proof that the mental rest had been stronger than the bodily

exertion; on the other hand, in one-third of the boys and in two-fifths of the girls the dynamometer showed a decrease of strength, which was especially noticeable in the weaker children, in fat children, and in those with anomalies of the cardiac function. After a long run, blood pressure was increased for about three minutes, but in the succeeding 15 minutes the pressure dropped to below the normal value. Forty per cent. of the children show a decrease of temperature in the axilla. Researches were further carried out in 250 school-children especially devoted to sport, in comparison with others who did only the prescribed gymnastic exercises or took no bodily exercise at all. It was ascertained that the size was but little influenced, but that the weight was increased by the stimulation of metabolism, and so were the spirometric and dynamometric index respectively. The examination of boys of 16–18 years of age who had gone through a short intensive course of training showed that the majority had an increase of weight and of hæmoglobin content of the blood, but a decrease of the spirometric and dynamometric index produced by latent fatigue due to over-exertion. Over-exertion of the heart was observed only when exercises had been performed without supervision.

Complaints by Dermatologists.

The dermatological and venereal section of the Berlin Medical Union recently held a meeting where the unfortunate situation of that branch of medicine was discussed. Although gonorrhœa had decreased by about one-third and syphilis by about two-thirds, the number of specialists for venereal diseases had increased by a quarter. It was stated that the recent law on the prevention of venereal diseases (mentioned in several of my former letters) had done harm to the profession in Berlin. Among other facts it was complained that if a specialist notifies under the law that a patient has interrupted treatment without being cured, the patient is summoned before the municipal health authority, and often sent back not to his medical attendant, but to one of the municipal dispensaries. This procedure is quite contrary to the agreement made between the city authorities and the union. It was moved that these abuses should at once be abolished, and that a fee for the notification of venereal diseases should be paid, as is legally provided for trades diseases.

Withdrawal of Medical Qualification.

It is very difficult in Germany to remove a medical qualification from a doctor proved unworthy to hold it. This can be done only if the qualification had been obtained by fraud, or when a medical man had been punished by a law court for a crime with the loss of civil rights, and then only as long as the punishment lasts. The government intend to alter this state of things, and have asked the opinion of the medical chambers on that subject. They propose that the qualification may be withdrawn if a medical man has proved not to possess the reliability necessary in his profession, but that the government shall be authorised to restore the qualification at its discretion. This provision has, however, not met with the approval of the chamber because it is too elastic. They are advising the Government to provide that the withdrawal of a qualification may be made legal if a medical man has been found guilty of severe criminal or moral offences, or if owing to a mental disease he is unable to practice. This, however, is to be done only if the supreme court of honour agrees, and the qualification may be re-granted only with the consent of that court. The matter is still in a preliminary stage and will not yet come before Parliament.

Special Motor Badge for Medical Men.

The German Motor Car Club (Adac) have resolved to introduce a special badge for the cars of their medical members. This badge will be a round plate with a red cross on blue ground and the arms of the Adac. The badge obliges the proprietor of the car to give first aid in accidents, to inform the next ambulance station, or to convey the injured to the nex hospital if necessary. He is further obliged to carr with him an adequate supply of medicaments fo first aid and material for dressings. The badge, whic is to be placed at the front of the car, will be given b the club to every member accepting the abov conditions.

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub.-Lt. F. T. Doleman to be Surg. Lt.

Proby. Surg. Sub.-Lts. J. D. J. Freeman, J. A. Whit G. O. Barber, R. P. Davies, D. G. Evans, E. G. Thoma and D. A. Williams to be Surg. Sub.-Lts.

Surg.-Lt. E. E. D. Gray to be Surg. Lieut.-Comdr.

ROYAL ARMY MEDICAL CORPS.

Capt. G. E. L. Simons to be Maj.

Temp. Lt. R. H. Dunlop relinquishes his commn.

F. H. A. L. Davidson to be temp. Lt.

REGULAR ARMY RESERVE OF OFFICERS.

Col. E. T. F. Birrell, late R.A.M.C., having attained th age limit of liability to recall, ceases to belong to the Re of Off.

TERRITORIAL ARMY.

Maj. W. A. Robertson to be Lt.-Col. and to comd. th 152nd (Highland) Fd. Amb.

H. G. Garland to be Lt.

ROYAL AIR FORCE.

The undermentioned are granted temporary commissio as Flight Lts. on re-employment: E. E. Isaac and G. S Ware (Hon. Squadron Leader).

Flying Officer A. L. St. A. McClosky is promoted to th rank of Flight Lt.

Capt. W. Wormington (Army Dental Corps) is granted temporary commission as a Flight Lt. (Dental) on attac ment to the R.A.F.

Flight Lt. W. R. Wotton (Capt. Army Dental Corp relinquishes his temporary commission on return to Arm duty.

DEATHS IN THE SERVICES.

Deputy Inspector-General Isaac Henry Anderson, R.N who died at Twyford, Winchester, on Feb. 2nd, aged 8 graduated M.D. at Queen's College, Belfast, in 1871, in whi year he entered the Royal Navy as surgeon. Appointed the *Salamis*, he served during the Egyptian War of 188 and for his services received the Egyptian medal and th Khedive's bronze star. He also served during the nav and military operations near Suakin in 1884, when he w awarded the Suakin clasp. After being promoted sta surgeon in 1883 and fleet surgeon in 1892 he had charge the naval hospital at Simons Town at the Cape of Go Hope, and received their lordships' approval for servic rendered at the hospital during the fever which occurr after the Benin Expedition. Later he served at Portsmout and retired in 1902. He was in receipt of a Greenwi Hospital pension for good services on the active list.

NAVY MEDICAL OFFICERS.

A Fleet Order calls the attention of medical and den officers to the regulations governing private professio practice. It is provided that if a plate is displayed it to show the officer's rank in the Navy, and must bear up it the words "Royal Navy." No hours of attendance s to be shown on the plate. No civilian appointment, su as on the staff of a civil hospital, is to be accepted with approval from the Admiralty.

COLONIAL MEDICAL SERVICES.

C. J. Wilson, Deputy Director of Medical Services, Ken has been promoted to be Principal Medical Officer, Federa Malay States.

The following appointments have been made:— Worger, Medical Officer, Fiji; C. E. Vaz, Medical Offic Public Hospital, Jamaica; G. D. Drury, Medical Offic Kenya; J. A. L. Innes, Medical Officer, West Afric Medical Staff, Nigeria, Southern Provinces; R. A. Newsc Medical Officer, Northern Rhodesia; R. H. Kippi Medical Officer, Somaliland; L. F. Day, Medical Offic Straits Settlements; A. McK. Fleming and I. C. Middlet Medical Officers, Tanganyika Territory; R. Stuart, Medi Officer of Health, West African Medical Staff (Colony allocated); R. Nicklin, Medical Officer, Zanzibar.

Correspondence.

"Audi alteram partem."

TREATMENT OF INFLUENZA.

THE PREVAILING EPIDEMIC IN LONDON.

To the Editor of THE LANCET.

SIR,—That the present epidemic of influenza will e excel in severity the visitations of recent years is eady only too obvious. Grave complications anifest themselves in the early stages of the disease, d may lead to death after an illness of three or four ys only. Powerless as we are to stem the tide now reading throughout the population, yet certain erapeutic measures, directed towards prevention or re of the complications, appear to be of definite lue, and of these I write.

Symptoms and Signs.—The outstanding symptoms a hundred cases observed during the last few eks were aching of the limbs, frontal headache, rd cough, sore-throat, and pain in the chest. The ter is limited to a small area of the chest wall, and, hough occasionally aggravated by inspiration, ually is unaffected by respiratory movements. nderness in the position of the pain is commonly nd together with limited movement of the chest the affected side. Auscultatory signs are wanting, d in the majority of cases the pain disappears in hours. Presumably a localised pleurisy is the cause the symptom. The temperature is found to be ised to about 102° F. in the afternoon, and falls to ° F. in the morning. The pulse-rate is raised oportionately. In cases which have subsequently veloped complications, however, the pyrexia has en of sustained nature at the outset, varying tween 103° and 104°. In such patients, on the ird or fourth day of the illness, the temperature and ılse have fallen during 24 hours, the change being sociated with a feeling of improvement on the part the patient. On the following day, however, both mperature and pulse have again risen to the former gh level, at the same time rapidly developing signs pneumonia have been observed. Leucocytosis is ten absent, and rarely exceeds 12,000. The fauces d palate are diffusely congested, but pus is seldom be found on the tonsils. In about 5 per cent. of ses there is tender enlargement of the glands lying ong the borders of the sterno-mastoid muscles.

Complications.—The cases presenting from the onset temperature of 104° F. with trivial daily fluctuations e those most prone to develop complications about e fourth day of the disease. These have been: ute otitis media, acute empyema of antrum, lobar eumonia, and septicæmia with no signs of localised flammation. The striking characteristic of all these ections is their extreme rapidity of development. slightly reddened tympanic membrane may change one bulged by pus in the course of a few hours. spite of early drainage acute mastoiditis follows dy too frequently. Similarly, one or more lobes of e lungs may become solid in the course of a few urs and a pleural cavity half fill with pus in a day. this year's epidemic the pneumonic signs are most always those of lobar distribution, in fact the gns and type of pyrexia resemble exactly those und in pneumococcal pneumonia, save that there is rely a crisis. Nevertheless, in all the complications entioned the preponderating organism is a hæmolytic ng streptococcus. It is this fact which suggests the ie of treatment to be followed.

Treatment.—In the first place, as soon as symptoms ve appeared, the patient must be put to bed, given brisk purge, and placed on a diet of fresh fruit—g., grape fruit and oranges and copious drinks of non squash, Contrexéville water, and not more an half a pint of milk daily. In uncomplicated cases, rtual starvation in this manner, good nursing, and fficient sleep, which must be procured, are all that necessary. If, however, the temperature is unusually high, the symptoms of exceptional severity and prostration marked, the case must be suspected as likely to develop grave signs. In all such intravenous administration of antistreptococcic serum should be practised. The dose to employ is 40 c.cm. daily for two or three days. It is quite remarkable to observe the sudden fall of temperature and subsidence of symptoms which often closely follows this measure. On the day following the first injection the temperature may be normal, but if no further serum be given, it often rises to 100° F. the next day, but this feature is of transient duration. Three of many cases thus treated had, in addition to the usual severe headache, high temperature and rapid pulse, respiratory rates of over 30 with pleuritic pain and grunting respiration, all of which developed in 36 hours. Within 12 hours of the injection of serum they were free from all symptoms save that of extreme lassitude.

Once pneumonia is definitely established serum appears to have but little effect. On the other hand, mercurochrome should be given a trial in these cases. I have seen recovery follow its use in apparently desperate cases of pneumonia and streptococcal septicæmia. The amelioration is shown after the first or second dose by the onset of lysis, fall of pulse-rate, and improvement in general condition. That recovery might have occurred in any case is, of course, the obvious and unanswerable comment. I can only reiterate that the use of the drug was apparently the means of averting death. Even if the evidence be slender from a scientific standpoint, yet when our patients are in peril such treatment, if not in itself a danger, should not be withheld. Of five streptococcal lobar pneumonias recently observed, four treated with mercurochrome recovered, the fifth treated on purely orthodox lines died. This may be pure coincidence. The preparation should be given intravenously as a 0·5 per cent. solution in doses of 10 to 15 c.cm. daily for three days. It is essential that the injection be made slowly. Larger doses are not to be recommended, and may produce severe griping. Empyemata should be aspirated repeatedly, and not subjected to open operation.

The *after-treatment* of influenza and its pulmonary complications is of the greatest importance. Palpitation and unstable pulse-rate are common sequelæ and referable to the effect of the toxin on the myocardium. These signs indicate further rest in bed, together with carefully graduated limb exercises supervised by a masseuse trained in the treatment of cardiac disease. If these exercises are skilfully prescribed the pulse shows progressive improvement in stability and rate, until the stage is reached when the patient can safely leave his bed. Kneading of the limb muscles is also of value in preparing the subject for convalescence, for it obviates much of the profound weakness which has characterised every influenzal epidemic of this century. Post-pneumonic cases should be given respiratory exercises, and these must be persisted in until equal movement of the two sides of the chest has been attained.

Finally, all but the mildest cases must be sent into the country for at least three weeks. During this time strychnine will be found of great value as a tonic, particularly in view of the low blood pressure which follows influenza and which will persist if convalescence is not properly supervised.

I am, Sir, yours faithfully,

A. H. DOUTHWAITE, M.D., M.R.C.P.,
Feb. 11th, 1929. Assistant Physician, Guy's Hospital.

NUCLEIN IN PNEUMONIA.

To the Editor of THE LANCET.

SIR,—Now that the scourge of influenza is again raging in Europe and America, and the death-rate from pneumonia is consequently increasing, may I, once more,[1] call attention to the method of

[1] See F. M. Gardner-Medwin: Brit. Med. Jour., 1924, ii., 497; and J. G. Willmore and F. M. Gardner-Medwin: THE LANCET, 1922, i., 116.

precipitating the crisis in pneumonia by means of intra-muscular injection of sodium nucleinate together with neutralisation of the subacidosis due to febrile toxæmia. A series of 40 consecutive cases was quoted of fulminating pneumonia so treated, in which the crisis was brought about in 48 hours or so with consequent defervescence and recovery, mostly occurring during the pandemic 1918. Since then my series has been uninterrupted so far as cases of lobar pneumonia, in previously healthy persons without crippling complications, is concerned. I do not claim that it is always successful in the ancient and infirm, or in advanced nephritics, or in the terminal pneumonias of long-standing disease, but I do claim that it is practically always successful in cases of straight pneumonia occurring as the result of the sudden lowering of resistance by influenza or sudden chill, and that these cases can be saved the debilitating strain of the long wait for the normal crisis which so often kills them.

Let me, then, formulate my credo: In influenza, leucopenia diminishes resistance. Saprophytic organisms become pathogenic. Sodium nucleinate releases leucocytes, latent in the bone-marrow, into the blood stream, increasing phagocytosis.

I believe that in nearly all cases of uncomplicated pneumonia, if sufficient bicarbonate of soda and glucose is given to render the urine alkaline or neutral, and 2 c.cm. of the solution of sodium nucleinate (put up by the Clin Laboratories of Paris) is injected intramuscularly into the thigh, in 48 hours or so the temperature will fall to normal, and convalescence will begin forthwith, and the patient will rapidly recover. I am not alone in my optimism, for Dr. L. E. Miller, of Lichtenburg, Transvaal, after using this method [2] on 117 natives, 87 of whom had lobar pneumonia, records a death-rate of only 8 per cent. He adds: "This treatment . . . is of definite assistance in terminating lobar pneumonia quickly and successfully."

I sincerely hope that practitioners who have used this treatment will give me the benefit of their opinion, and their results.

I am, Sir, yours faithfully,
F. M. GARDNER-MEDWIN.

St. Asaph, North Wales, Feb. 10th, 1929.

ASTHMA RESEARCH.

To the Editor of THE LANCET.

SIR,—My friend, Dr. Culpin, being, as he is, not merely a psychotherapist but a clinician of wide experience, has no need of aid in the present discussion. But I would like to suggest that some individuals who display the biochemical reactions upon which Mr. Coke and others lay such stress, in association with asthma, in the presence of cats, may well be thereby expressing a repressed or forgotten horror of cats due to some terrifying infantile experience. As a matter of fact, as some of us know, this is apparently the case often enough. And the most economical method of effecting a cure is to revive and explain the forgotten experience: not to carry through desensitisation in the absence of psychological investigation. On the other hand, those who have a lively horror of cats, present ever to their minds, and who do not hesitate to express what they feel, do not seem to suffer asthma and to display the biochemical reactions in question, even though, as sometimes happens, they have forgotten the early experiences in association with cats that have so impressed their organisations.

It seems relevant to point out that, at two recent medical meetings, papers were read on Vertigo (R.S.M., Section of Otology) and Exophthalmic Goitre (Manchester Medical Society). Mutatis mutandis, all that Dr. Culpin has said about asthma is applicable to these two maladies. Yet I have failed to find, in reports of these meetings, the faintest indication of awareness that psychotherapy does afford rapid and lasting relief to many persons suffering from vertigo or exophthalmic goitre without surgical treatment, or even in spite of it.

Surely some quickening of knowledge in respect of what I may call clinical psychotherapy is badly needed, and without delay. But, as I was recently asked, at a meeting of general practitioners, how is the general practitioner to learn? We have, first, to settle the problem of who is to teach the teachers—to say nothing about the researchers.

I am, Sir, yours faithfully,
Wimpole-street, W., Feb. 9th. F. G. CROOKSHANK.

To the Editor of THE LANCET.

SIR,—Mr. Coke evidently confounds psychotherapy with psychoanalysis. His emotional reaction to the latter is quite understandable, but there exists no necessity to have recourse to mysticism or pseudo-scientific theory. Pavlov's work, which is scientific work of the highest order, helps us to understand and explain most, if not all, cases of "psychogenic asthma," and there is no longer any doubt about its existence. I should like to refer Mr. Coke to the correspondence on this subject in your columns two years ago.[1]

I am, Sir, yous faithfully,
Shortlands, Kent, Feb. 9th, 1929. A. WOHLGEMUTH.

To the Editor of THE LANCET.

SIR,—Dr. Culpin and Dr. Ross have paraphrased sentences out of my letter at great length, in an attempt to produce a reductio-ad-absurdum argument to my contentions that nervous manifestations carry a stigma, especially when wrongly applied to asthmatics.

So far from being convinced by them, I hold that anything short of perfection in health, strength, and beauty carries with it a proportionate stigma, or mark of inferiority. If two women are sitting on a bench, the one with a fine healthy child, the other with a weakling, the mother with the latter child will "feel a bit green," to describe the complex in the vernacular. The small boy puts off going to the sick-house as long as is possible, because to do so is to drop behind a standard of perfection, probably in his case some beefy boy who is captain of the football team. If the young bride has the "misfortune" to be so "unlucky" as to marry a "poor fellow," whose "unhappy" lot it is is to "lapse" into a state of neurasthenia, who is there amongst her friends who will not "commiserate" with her in the family's "sad affliction"? The man of 6 boasts of his two rounds a day in the presence of the man who can only accomplish 18 holes. The old buffer, who can still stand up, chaffs his friend tucked up in a bath-chair.

But, to take the battle into the enemy's country, a patient was sent to me suffering from irritability, fits of temper, and some suggestion of developing grandiose ideas; these made it difficult for him to maintain a very substantial business position, or to live happily at home. Carrying out full protein tests I found that he gave a large reaction to potatoes. His temper and general equanimity returned to the normal on carefully avoiding that article of food. The work of W. R. Shannon in America demonstrates the connexion between the fractious, cantankerous child, with his bursts of temper, and sensitisation to foods. Lastly, I should be extremely interested to know whether people, who have this cat phobia, are indeed sensitive to cats, as demonstrable by the dermal reactions. Is it the sense of smell or sight that starts the alarm? Are they aware of the cat's presence, which to others is unsuspected?—conversely would they exhibit these fears if told a cat were present, when such was not really the case?

When one has seen such purely mechanical nervous action to take place as the paralysis of the accommodation of the eye following the eating of an apple or the development of a patch of herpes facialis following the ingestion of a piece of cheese, or a

[2] South African Med. Rec., 1926, xxiv., 531.

[1] THE LANCET, 1927, i., 962, 1323, ii., 88.

ack of asthma from the unsuspected presence of a nea-pig in the room, it is difficult to say how many ser strings may not be played on by biochemical mechanistic means.

Where Dr. Ross gets his idea that I start by disieving my patients, or that I am lacking in charity, o not know. The palmists tell me that my thumb ns outwards to an astonishing degree.

I am, Sir, yours faithfully,

eb. 11th, 1928. FRANK COKE.

THE EGYPTIAN CONGRESS OF MEDICINE.

To the Editor of THE LANCET.

SIR,—It may appear ungracious to comment on very generous appreciation of our recent Centenary ngress in Cairo which appears in your issue of n. 12th (p. 101), but I would like to be allowed to rect a few inaccuracies which have unconsciously pt into your correspondent's account of the ceedings.

First, it is only right that a tribute should be paid the extraordinary keen and personal interest en in the Congress by H.M. King Fuad, whose mple served as a powerful stimulus to us all. His jesty was graciously pleased to receive at the hands the Chancellor, who is also the Minister of Educan, H.E. Ahmed Bey Lotfy El-Sayid, the first norary degree (Doctor of Laws) conferred by the yptian University. His name will also be ever ociated with the new hospital. The formula pted at the ceremony of the laying of the foundan-stone was :—

"This foundation-stone of the new buildings of Kasr-Ainy School of Medicine and the King Fuad I. Hospital, ich form the Faculty of Medicine in the Egyptian Unisity, was laid by His Majesty on Dec. 16th, 1928, in the venth year of his reign."

is perpetuating the name of Kasr-El-Ainy and orporating that of King Fuad at the same time. e new school is planned to provide for 600 students, l the hospital will eventually contain 1500 beds not 700 as stated—and allow of 3000 out-patient endances a day. In the year that is just past sr-El-Ainy gave relief to 18,000 in-patients and alled 510,000 out-patient attendances, an increase 12,000 over those for 1927.

Stress might also be laid on the extraordinary erest and enthusiasm caused by the conferring of Honorary Fellowship of the Royal College of rgeons on Aly Bey Ibrahim. This was a very turesque ceremony, distinguished by a brief but pressive address by Sir Berkeley Moynihan, the sident of the College. The memorising by the dents of some such striking phrase as "this is the hest honour the College has in its power to bestow" s clear evidence of the impression created by this narkable compliment extended to the Faculty of dicine of Cairo by the Council of the Royal College. e presentation of addresses and the reception of legates from all corners of the globe appealed very ongly to the staff and students of the Faculty, o were delighted to see so many leaders of the fession who hitherto had been only names to m.

With such a cosmopolitan gathering the selection recipients for honorary degrees was exceedingly ficult, and the following 20—not 13—were honoured the M.D. Degree at the final meeting of the ngress :—

Germany : Prof. Fülleborn, Hamburg ; Prof. Kleine, lin.

Belgium : Prof. Henri Frédéricq, Liège.

United States of America : Prof. Bailey Ashford, Porto o.

France : Prof. Lépine, Lyon ; Prof. Brumpt, Paris ; Prof. mas, Montpellier ; Prof. Vaquez, Paris.

Great Britain : Sir Berkeley Moynihan (M.S.), Sir Holburt ring (M.S.), Sir William Wheeler (M.S.), Sir Robert Philip, l Sir Cooper Perry (in absentia).

Greece : Prof. Aravantino, Athens.

Italy : Sir Aldo Castellani and Colonello Grixoni.

Japan : Prof. R. Kawamura.

Holland : Prof. Schuffner.

Prof. Euziere, Dean of the Faculty of Montpellier, Clot Bey's alma mater.

According to a precedent observed at all previous congresses held in Egypt, the names of the senior national delegates were submitted to His Majesty for honourable distinctions and were therefore not included in the list for honorary degrees, a circumstance which should be mentioned, to remove any misunderstanding on this score. The list of honours is being awaited with considerable interest.

Perhaps the most interesting incident in the course of the week was a meeting between H.E. Shaheen Pasha, Under Secretary of State for Public Health, and some of the principal British delegates at which a very frank and cordial conversation took place on public health questions in general, on the position of Egyptian students in England, and on the general medical relations between Egypt and England. All the delegates were unanimous in their appreciation of Shaheen Pasha's broad-minded views on all these matters and an excellent spirit of mutual satisfaction and conciliation prevailed.

Finally, a word of praise to Dr. M. Khalil, professor of parasitology, and secretary-general of the Congress, for his excellent work, would not be out of place. It was due to the cordial coöperation of the staff of the Faculty and the organisation committee that we were able to survive the strenuous labours entailed by a congress on such a comprehensive scale and to carry it through to a successful issue.—I am, Sir, yours faithfully,

FRANK C. MADDEN,
Dean of the Faculty of Medicine
Jan. 28th, 1929. Egyptian University.

*** We take the opportunity of adding that the Egyptian Government has issued two postage stamps to mark the importance of the occasion. The first (5 milliemes) depicts Imhotep, the Egyptian deity of

EGYPTE
CENTENAIRE DE LA FACULTÉ DE MÉDECINE - LE CAIRE
10 MILLS
CONGRES INTERNATIONAL DE MEDECINE - 1928
EGYPTE
CENTENAIRE DE LA FACULTÉ DE MÉDECINE - LE CAIRE
5 MILLS
CONGRES INTERNATIONAL DE MEDECINE - 1928

medicine, seated on his throne, grasping the sceptre of power in his right hand, and the "ankh" or symbol of life in his left. The second (10 milliemes) is a portrait of the Viceroy Mohamed Aly Pasha, to whom the foundation of the medical school of Cairo 100 year ago was due. Dr. Jamieson B. Hurry, who sent us the stamps, remarks that this is probably the first time in the history of medicine that one of its tutelary deities has appeared on a stamp.—ED. L.

INSULIN IN OILY SUSPENSION.

To the Editor of THE LANCET.

SIR,—More than a year ago I came to the conclusion that some cases of diabetes mellitus with the usual typical thirst, polyuria, and hyperglycæmia made a complete recovery provided they were treated with a fixed diet which supplied sufficient energy and tissue-repairing protein along with insulin

in doses which kept the concentration of the sugar in the blood below 0·15 per cent. throughout the 24 hours. In order to obtain this control of sugar in the blood some cases might require four or more injections of insulin during the 24 hours; this made the treatment very difficult. It occurred to me that it might be possible to prolong the action of an injection of insulin by delaying its absorption and thereby obtain the desired effect. I considered several possible methods, and in August of last year I asked a manufacturer of insulin to supply me with an oily suspension.

Since November last I have used this in private and at the London Hospital, and find that I can give 90 units as a single dose, which will control the sugar in the blood just as well as three aqueous doses of 30 units each at intervals of six hours. I have used an oil that is acceptable to some patients, whilst others complain of pain lasting some time after the injection. The ideal oil will not give rise to pain, but it must be capable of keeping in suspension at least 60 units of insulin per cubic centimetre if it is to be used in very severe cases. The optimum concentration of the injection will have to be determined for each case.

I shall feel indebted to any one who gives me a list of oils the hypodermic injection of which does not lead to discomfort.

I am, Sir, yours faithfully,

Portland-place, W., Feb. 11th, 1929. O. LEYTON.

LOCAL ANÆSTHESIA IN UPPER ABDOMINAL SURGERY.

To the Editor of THE LANCET.

SIR,—A large experience of novocaine in spinal analgesia, resulting from the routine use of it in the practice of two general hospitals, prompts me to add a few observations to the very instructive paper by Prof. Pannett in your last issue.

First, I suggest that dosage should always be indicated by the number of centigrammes of solid novocaine injected, for the actual percentage solution of the drug in the cerebro-spinal fluid is an unknown quantity, and the presence of ampoules of different percentage strength about an operating theatre is a trap for the unwary who think in cubic centimetres. The 10 per cent. solution in normal saline is certainly the most convenient to use, because each tenth of a cubic centimetre contains one centigramme. I believe that the extent of analgesia obtainable is directly proportional to the amount of drug injected, that its extension is mainly by diffusion, that gravity plays a small but unimportant part and is of little practical help. The higher the injection is made the greater the chance of high diffusion. I have so frequently injected between D. 12 and L. 1 without regret, that I cannot help thinking that the spinal cord is in little danger, provided that the needle is not plunged haphazard into the theca, but only so far as to obtain fluid. Between L. 1 and L. 2 I regard as safe.

The extent of the result must be estimated, and if deficient a second injection may be made to enhance it. On no account may the patient be questioned as to his sensation, for if this is done his confidence is lost. A small dose in the lower intervals will result in tingling in the legs, absence of sphincter reflex, loss of corrugation at the anal margin, and the operation for piles may be commenced. With increasing doses at higher levels inability to raise the legs proves that the lumbar segments are out of action, and paralysis of the lower rectus gives a characteristic appearance which is unmistakable (D. 9–12). If the upper segments of the muscle are unaffected, the umbilicus is drawn up when the patient coughs. At this level analgesia of the abdominal wall below the umbilicus may be relied upon, but splanchnic sensation may be felt when the appendix is delivered, often as windy or colicky pain in the epigastrium. Analgesia involving the nipples implies, as Prof. Pannett says, that the splanchnic communications are cut. Slight tingling in the upper limbs foretells that the surgeon is likely to make an easy exit from the abdomen if he does not much exceed one hour.

Nausea and vomiting are unfortunate accompaniments, but generally indicate high level results. The onset is from about 20 minutes after injection, and its duration corresponds to the period of lowest blood pressure. From its termination the condition of the patient may be expected to improve steadily towards the end of the operation, when the pulse may be satisfactory and there may be no post-operative shock. It is quite common for the pulse to become infrequent and as low as 40 per minute; it may also be impossible to feel it in the temporal artery. The dose may be up to 15 centigrammes, with from 10–12 as an average, but more than this has often been given in some of my cases when more than one injection has been given. The toxic effect of any quantity of novocaine likely to be used in this method is negligible, but this cannot be said of stovaine.

Progress in this method is, I believe, likely to be made by greater confidence in administration, more certain estimation of results, and a realisation that a second injection may be made to improve those which are imperfect. That this is the easiest and most certain way of obtaining splanchnic block, I have no doubt. That it will ever by itself become the method of choice for serious high operations I do not believe, unless the fall of blood pressure can with certainty be countered; for it may be a trial of fortitude for the most phlegmatic patient, and the more nervous he is the less welcome will it be. That it can be so used, if necessary, is certain. Its ordinary use for these cases is in combination with general anæsthesia, and tracheal insufflation offers the widest margin of safety. For minor abdominal work and low operations it has long been a commonplace success though pneumonia sometimes follows its use. Doubt cast upon the efficacy of novocaine can only be explained by imperfect knowledge of dosage, which is at least double that of stovaine.

I am, Sir, yours faithfully,

W. HOWARD JONES, M.B., B.S. Lond.,
Surgeon-Anæsthetist to Charing Cross Hospital.

London, W., Feb. 12th, 1929.

THE TREATMENT OF HÆMORRHOIDS BY INJECTION.

To the Editor of THE LANCET.

SIR,—Dr. Whitcombe's last letter calls for a brief reply from me, if only to point out the peculiar method he has of giving references. He quotes a paragraph which he alleged that he took from "the text of the official report, which followed the proctological meeting at the Royal Society of Medicine on July 9th, 1924." Naturally, I assumed that he referred to the Proceedings of the Royal Society of Medicine. But when I turned to that volume I found not a word of Dr. Whitcombe's quotation, but a summary without comment of the various papers and speeches, which is almost identical with that published in THE LANCET (1924, ii., 117)—the reference given by Dr. Whitcombe in the letter in which he first attacked the treatment of hæmorrhoids by injection.

Having found that both his references were misleading, I was compelled to ask him personally whence he had quoted, and ascertained from him that his quotation was not really from "the official report" nor from THE LANCET, but from a report of the same meeting in the *British Medical Journal* of July 19th 1924. In this number of your contemporary a verbatim report is given of the opening paper of the late Mr Græme Anderson, who up to the time of his lamented death was an advocate of the treatment by injection. On another page of the same number of the *Journal* is a very brief summary of the remaining speeches made at the meeting. This is written by somebody who obviously had a strong bias against the treatment, because, apart from referring to Mr

nderson's paper on another page, it quotes only peeches made by two American surgeons who were iolently opposed to the treatment, and does not efer at all to those of the numerous British and merican surgeons who spoke in favour of injection. n the middle of this short summary the words quoted y Dr. Whitcombe appear. But anybody who takes ne trouble to read the summary of all the papers and peeches, either in the "official report" or in your own eport of the meeting, will agree that the "general pinion" was certainly not that arrived at by the eporter in your contemporary and by Dr. Whitcombe.

Dr. Whitcombe accuses me of inconsistency, and quires why I have changed my methods of injection. y reasons were fully set out in the paper of mine hich you published.[1] and in the recently published print of my book on Hæmorrhoids. Briefly, they ere in order to eliminate the few and rare compli- tions which occurred with the older methods— mplications which were not as numerous nor as rious as those mentioned by Dr. Whitcombe as casionally occurring after treatment by galvano- utery. I should still hesitate long before I injected oily solution into the veins of the pile-mass. The *bmucous* injection of an oily solution is quite another atter.

No doubt Dr. Whitcombe's results from treatment galvano-cautery are satisfactory on the whole, it I am not convinced that his method is either as tisfactory or as safe as the treatment by sub- ucous injection, and it is certainly more lengthy d troublesome both for the patient and the surgeon.

I am, Sir, yours faithfully,

ARTHUR S. MORLEY.

Upper Wimpole-street, W., Feb. 9th, 1929.

TONSILLECTOMY IN CHRONIC ARTHRITIS.

To the Editor of THE LANCET.

SIR,—Mr. Pavey-Smith's paper and the leading ticle in your issue of Jan. 26th bear out the opinion ave often expressed that tonsillar infection seldom ars any relation to chronic articular rheumatism.

200 cases only out of a total of 7000 cases rheumatic disease were the tonsils considered fficiently infected to warrant enucleation. As 44 of ese 200 were of the acute rheumatic type, these ould be excluded as it is, I think, agreed that the iology of rheumatic fever and of so-called chronic eumatism of joints is not the same. If we also take t fibrositis, neuritis, and sciatica we are left with ne 120 cases, or less than 2 per cent. of the whole mber. Of these, 15 reported themselves as cured d 65 as improved, which works out at just about er cent.

The bacteriological findings are of considerable erest. These also confirm my own experience that hæmolytic streptococci never have any direct sal connexion with arthritis. When present in tonsil and causing actual tonsillitis, no doubt they er the general resistance of the system, but non- molytic streptococci are, on Mr. Pavey-Smith's wing, far the most important in chronic arthritis. ne compares these statistics with those of Howarth l Gloyne, who found that hæmolytic streptococci urred in the ratio of 16 to 22 of non-hæmolytic, re is but little difference; not more than would be ounted for by the fact that the former are from ldren only in whom sore-throats are more common. m the adult tonsil, unless acute tonsillitis is ually in being, it is unusual to cultivate a hæmolytic ptococcus. That a white staphylococcus was nd in pure culture in two tonsils in cases of umatoid arthritis (infective arthritis D. where no is of infection was discovered) is in accordance h my hypothesis that a white staphylococcus ction (*M. deformans*) is the primary cause of umatoid arthritis.

To sum up, tonsillar infection is of outstanding portance in cases of acute and subacute rheumatism. It is of much less importance in all other forms of infective arthritis, and in cases of osteo-arthritis the tonsils as a focus of infection may be completely disregarded. Only one case occurs in Mr. Pavey-Smith's series.

I am, Sir, yours faithfully,

London, W., Jan. 30th, 1929. H. WARREN CROWE.

[1] THE LANCET, 1928, i., 543.

RADIUM TREATMENT OF CANCER IN FRANCE AND BELGIUM.

To the Editor of THE LANCET.

SIR,—In their article on this subject (THE LANCET, Feb. 9th) Mr. Armour and Mr. Souttar pay very gracefully a well-merited tribute to the great courtesy and kindness extended by the staffs of French and Belgian radium clinics to them as to many other visitors for years past. They do not mention, however, one particular in which the workers of Brussels and Paris have seemed to outshine some others. It is in their willingness not only to give, and give generously, of their experience, but in their equal readiness to learn and to avail themselves of suggestions put forward by their visitors. Notwithstanding the handsome words in the closing paragraph about workers at home, the article hardly seems to us to disclose familiarity with the stage radium work in this country has reached. For example, after reading the account of Columbia paste, an English surgeon would perhaps be surprised to hear that this wax, in convenient sheets of standardised thickness (15 mm.) and standardised melting point, can be purchased over the counter at a well-known chemist's in Oxford-street, or that the salesman will naturally say, "Do you want the lead, Sir?" referring to sheets of standard thickness beautifully rubber-covered.

There is no reason, of course, unless a visit were paid to home clinics, why the authors of the article should know this, or that the Brussels "shavings" method—which is difficult—is being substituted in London by the use of plastic wood.

We are, Sir, yours faithfully,

E. ROCK CARLING,
London, Feb. 10th, 1929. STANFORD CADE.

MARVELLOUS MONTPELLIER MIDWIFERY.

To the Editor of THE LANCET.

SIR,—About eight months ago I published in your columns[1] a note under the above heading, in the hope that a little ridicule, culled from the old Montpellier doctor, Rabelais, would prevent your readers from attempting "the delivery of women by appointment at a fixed hour" introduced by the modern Montpellier doctor, Prof. Delmas. The latter's method consists in rapid manual dilatation of the cervix under the influence of spinal anæsthesia, followed by version or forceps, and is a revival of "accouchement forcé," with the additional risk of spinal anæsthesia.

Three French obstetricians appear to have taken Prof. Delmas *au sérieux* and have put his method to the test—not, indeed, to deliver ordinary cases "painlessly, by appointment, at a fixed hour," but for certain definite indications calling for artificial delivery. Their cases, 14 in number, should be read[2] by those who contemplate trying the method of Delmas. Of Mr. Laurier's eight cases, one died of post-partum hæmorrhage, seven had lacerations of the cervix, and three had slight tears of the perineum. Three children were dead before the operation. Mr. Laurier calls attention to the facility with which the cervix can be dilated in certain cases—in some it was incomplete—but "does not think the method a safe one to be placed in all hands and without formal indications." The results, above mentioned, seem to call for a stronger condemnation.

[1] THE LANCET, 1928, i., 1250.

[2] Bulletin de la Société d'Obstétrique et de Gynécologie de Paris, December, 1928.

Of Mr. Metzger's five cases, in one it was impossible to dilate the cervix, in two others there was difficulty in performing version or embryotomy, the difficulties being due, in the author's opinion, to the hypertonicity of the body of the uterus caused by the spinal anæsthesia. One of the cases died of post-partum hæmorrhage on the fourth day of the puerperium, and in two other cases post-partum hæmorrhage occurred. The author, "having never seen such a rapid death from bleeding on the fourth day," thinks that the bleeding may have been due to sudden relaxation of the uterine hypertonicity. He concludes: "For my part, after what I have seen, I am little disposed to make any more trials, and I cannot too strongly recommend prudence."

Mr. Cathala's single case was treated under spinal anæsthesia, owing to the existence of tuberculous laryngitis. The dilatation of the cervix was difficult and incomplete. The child was delivered by forceps. Slight tears occurred in the cervix and fourchette. The puerperium was febrile, and the patient died in an attack of cyanosis one month and two days after delivery. Mr. Cathala gives an excellent criticism of the use of spinal anæsthesia for the purpose of facilitating the dilatation of the cervix in obstetrical cases, and of Delmas's method he says, that it should be rejected if it has no other object than to obtain "a painless delivery at a fixed hour."

I am, Sir, yours faithfully,

HERBERT R. SPENCER.

Bickenhall Mansions, London, W., Feb. 5th, 1929.

Public Health Services.

INFLUENZA.

CLINICAL reports indicate that influenza is rather more widespread throughout the country than a week ago, although in general the type of disease is mild. Prevalence in Manchester, Liverpool, and the Lancashire towns continues, and there is a spread eastward to Leeds and Bradford. The extent to which the reported deaths in London and the great towns have risen during the week is shown in the following summary. In London the epidemic is now more evenly distributed and is still described as mild in type. In the Scottish 16 towns the general death-rate fell from 37·9 to 28·2 for the week ended Feb. 9th. The towns showing a rise are Edinburgh (33·7), Dundee (37·7), Kirkcaldy (23·9), and Ayr (26·0). The general death-rate in Glasgow was 27·6. Deaths from respiratory diseases in the 16 towns numbered 449, as against 675 in the previous week, and those from influenza 220 as against 323. Pneumonia notifications fell from 1268 to 919.

Reports published by the Health Section of the League of Nations indicate that the epidemic is subsiding generally. The rate of progress of influenza across Europe has not been as rapid as it was in 1921–22 and 1926–27, and in certain limited areas on either side of the Irish Sea and North Channel the disease has prevailed in a more severe form than in either of these two outbreaks. It has been widespread in Southern Norway, in Copenhagen, and adjacent regions of Denmark, as well as on the shores of the Finnish Gulf, including both the Finnish and Esthonian coasts, but the prevailing type has been mild hitherto. In Germany only Brandenburg, Saxony, Lower Silesia, and Bremen have been seriously affected up to the present, and death-rates have in no case been more than half as high as those recorded in Western Scotland and Northern Ireland. An outbreak of average severity occurred in Madrid in January. Influenza has now made its appearance in parts of the Netherlands and Northern France, but at the beginning of February it was still rare elsewhere in Europe. The influenza epidemic which has traversed North America from west to east is now definitely on the decline.

INFECTIOUS DISEASE IN ENGLAND AN WALES DURING THE WEEK ENDED FEB. 2ND, 1929.

Notifications.—The following cases of infectiou disease were notified during the week:—Small-po 230; scarlet fever, 2490; diphtheria, 1444; enteri fever, 34; pneumonia, 3511 (last week 2422); pue peral fever, 40; puerperal pyrexia, 129; cerebr spinal fever, 5; acute poliomyelitis, 3; acute poli encephalitis, 2; encephalitis lethargica, 14; dyse tery, 10; ophthalmia neonatorum, 83. No case cholera, plague, or typhus fever was notified durin the week.

Cases of pneumonia were reported from every count the largest numbers being London, 513; Chester, 15 Durham, 149; Essex, 123; Lancaster, 965; Warwick, 12 Yorks West Riding, 292.

The number of cases in the Infectious Hospitals of t Metropolitan Asylums Board on Feb. 5th–6th was as follow Small-pox (44 under treatment, 4 under observation scarlet fever, 1903; diphtheria, 2071; measles 56; whoo ing-cough, 791; puerperal fever, 19 (plus 7 babies); enceph litis lethargica, 78; poliomyelitis, 5; "other diseases," 6 At St. Margeret's Hospital there were 13 babies (pl 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, includi London, there was no death from small-pox, 2 (0) fro enteric fever, 53 (2) from measles, 9 (2) from scarl fever, 149 (49) from whooping-cough, 46 (13) fro diphtheria, 65 (11) from diarrhœa and enteritis und two years, and 652 (198) from influenza. The figur in parentheses are those for London itself.

The number of deaths from influenza during the previo eight weeks was 60, 61, 69, 83, 99, 122, 179, and 321 respe tively, the rate of rise being much steeper in the last thr weeks. The figures for London during the previous eig weeks have been as follows: 10, 9, 9, 15, 18, 34, 39 and 7 The deaths from influenza in the week under review st occurred largely in the Midland and Northern countie Liverpool, 75; Manchester, 43; St. Helens, 29; Port mouth, 25; Southampton, 19; Birkenhead, 17; Bootle, 1 Warrington, 13; Wallasey, 11. No other great town h as many as ten. Glasgow reported 184 (a substanti diminution from 236 in the previous week), Belfast 105, a Edinburgh 41 during the same week. The two deat from enteric fever outside London occurred at Preston a Sunderland. Liverpool reported 14 deaths from measl Cardiff 8, and Newcastle-on-Tyne 5. In Manchest 13 deaths from whooping-cough were reported, 11 fro Liverpool, 7 from Warrington. Birmingham stood highe for diphtheria with 4 deaths. Liverpool had 11 deat from diarrhœa, Birmingham 7, and Salford 6.

The number of stillbirths registered during the we was 275 (corresponding to a rate of 42 per 10 births), including 43 in London.

FRENCH HOSPITAL AT TANGIER.—Owing to t inadequacy of hospital accommodation at Tangier it h been decided to add a new wing and other accessories to t French hospital, thus increasing the accommodation native patients.

CONFERENCE ON MATERNITY AND CHILD WELFA The fifth English-Speaking Conference on Maternity a Child Welfare, organised by the National Association for Prevention of Infant Mortality, in coöperation with Maternity and Child Welfare Group of the Society Medical Officers of Health, and numerous other organisatio together with representatives from the Dominions, will held at Friends House, Euston-road, London, N.W., fr Tuesday, July 2nd, to Thursday, the 4th, with visits institutions on Friday, the 5th. The main subjects discussion will be the care of the child between 1 and 5 ye of age; maternal mortality and morbidity; the holdin special venereal diseases clinics for women and children connexion with maternity and child welfare departmen and the suffering entailed on mothers and young children prolonged waiting in out-patients' departments of hospit Lectures and film displays will be given during the eveni and arrangements will be made for visits to a wide rang child welfare institutions in London. Sanction has b given by the appropriate authorities for the payment expenses of delegates from local authorities, and rail companies in Great Britain have agreed to issue ticket reduced rates. Further information is obtainable f Miss Halford at 117, Piccadilly, London, W. 1.

Obituary.

THOMAS DUNCAN GREENLEES, M.D., F.R.S. EDIN.

WE regret to announce the death of Dr. T. D. Greenlees, which took place on Jan. 22nd at St. Leonard's-on-Sea, where he had lived in retirement for the last few years. The son of Dr. Thomas Greenlees, he was born in 1859 at Ballantrae, Ayrshire. His medical studies were pursued for a year in Glasgow University, and thereafter in Edinburgh University, where he graduated as M.B. in 1882 and as M.D. in 1901. After a short experience of general practice, he joined the staff of Garlands Asylum, Carlisle, in 1884. Three years later he became assistant medical officer to the City of London Asylum at Dartford, and in 1890 he was appointed medical superintendent of the Grahamstown Asylum, South Africa, a post which he held for over 17 years. He returned to this country in 1908 to take charge of a private asylum at Tulse Hill, resigning in 1913. He held a commission as surgeon-captain in the Boer War, and from August, 1914, to July, 1918, he was a major in the Royal Army Medical Corps, and held several important home appointments.

High intellectual attainments, alertness, great force of character, and untiring energy combined to make Dr. Greenlees a very capable asylum administrator. He did original research work as an assistant medical officer, and in 1885 he gained the blue ribbon of the Medico-Psychological Association for his prize essay on Diseases of the Circulatory System in the insane. He also made several important contributions to psychiatry in medical journals both in this country and in South Africa and America. Handicapped though he was by his health, which was never very robust, his enthusiasm and energy carried him further than most, while his kindly and sympathetic nature made him many life-long friends. At one time president of the Caledonian Medical Society, he also represented South Africa for many years on the Council of the British Medical Association.

Dr. Greenlees is survived by his widow, two daughters, and a son.

HENRY H. L. PATCH, M.R.C.S. who died on Feb. 7th, aged 58, was in practice in Liverpool as an anæsthetist, and was held in high esteem by his colleagues in the district. He received his medical education at St. Thomas's Hospital, and after qualifying was appointed house surgeon to the Devon and Exeter Infirmary, where his grandfather and great-grandfather had been surgeons. After 18 months there he entered general practice at Chudley, Hertford, and London. Eight years ago he went to Liverpool, where he devoted his whole time to the administration of anæsthetics, in the art of which he had unusual ability. He was anæsthetist to the Royal Infirmary, the Northern Hospital, the Liverpool Medical Research Organisation, and the Ministry of Pensions. "His quiet confidence and wonderful disposition," writes a colleague, "were of great advantage to those with whom he worked. A most unselfish character and kindness of heart won for him many friends, and his death will be an irreparable loss to them all. The last three years of his life were harassed by illness, but he carried out his duties with magnificent fortitude, both in the hospitals to which he was attached and in private practice." Dr. Patch leaves a widow with a son, and two grandchildren.

Dr. HERBERT ARTHUR SMITH, who died at Ealing on Jan. 29th, in his seventy-seventh year, was the son of Dr. Thomas Smith, of Wheatley, Oxon., where he was born in 1852. He was educated at Durham and Edinburgh Universities, and studied medicine at St. Mary's and Middlesex hospitals, qualifying L.S.A., and L.R.C.P. Edin. in 1878, and M.R.C.S. Eng. in the following year. After holding house appointments at several London hospitals and acting as medical officer to cable-laying ships, he took the M.D. Durh. before settling down in general practice at Ealing. While acting as surgeon to the cottage hospital there, his interest in mental and nerve diseases grew, and he finally devoted himself largely to them alone; a study of the biological and clinical aspects of pain appeared from his pen in a hospital journal. Besides, he was a ready writer on popular scientific subjects, his last book being a collection of verses aimed at bringing the doctrines of revelation into line with modern scientific thought. To the last he remained a student, keeping closely in touch with the modern theory and practice of medicine.

WE have to record the death, on Jan. 31st, of KENNETH BAMFORD WILLIAMSON, M.B. Edin., at the age of 33, after two days' illness. The son of Mr. Bamford Williamson, of North Shields, he was educated at Mill Hill. Throughout the late war he served with the Royal Garrison Artillery, winning the Military Cross, and retiring with the rank of Major. At Edinburgh University, where he took up the study of medicine, he graduated in 1921 with second-class honours, later holding resident appointments at the Edinburgh Royal Infirmary and the Royal Maternity and Simpson Memorial Hospitals. After further experience in London, as house physician to the Paddington Green Children's Hospital, he went to Penrith as assistant to Dr. D. C. Edington, whom he subsequently joined in partnership. His work as practitioner in Penrith, where he was also medical officer to the cottage hospital, was greatly valued in the town, and at his funeral there was much evidence of the affection in which he was held. Dr. Williamson's widow, who is left with a son two months old, is a daughter of the late J. Simpson Harker, of Penrith.

JOHN ADOLPHUS SHARP, M.R.C.S., who died on Jan. 26th in his eighty-second year, spent almost the whole of his long professional career in Derby, where he was still in practice at the time of his death. He first went to the town as house surgeon to the old Derbyshire General Infirmary, soon after qualifying from Guy's Hospital in 1868, and he later became surgeon to this institution. In 1896 he retired from practice, and his place was taken by Dr. C. H. Taylor; but ten years later, on Dr. Taylor's death, he resumed his active work, and continued for the rest of his life to take a considerable part in local affairs. Dr. Sharp's widow is a daughter of the late Edward Dumas, of Derby, and he leaves a daughter and a son, Dr. J. E. Sharp, of Chelsea.

WE have received from Colonel A. W. Sheen the following tribute to the late Dr. JOHN OWEN, of Liverpool, whose death was announced last week in our columns:—

"I am minded to write a tribute of warm affection and regard, shared I know by all his war comrades, to the life and memory of John Owen. When I commanded the Welsh Hospital in India, of 3000 beds, 'Major John,' as we all knew him, was in charge of the Medical Division. His good work, his kindness, and his personal charm endeared him to all. And there were in his character special traits of modesty, humour, and fearlessness. The last was shown by his zeal for big game-hunting, and by his sorrow that his lot had not been cast in a more active theatre of war. But duty was paramount with him; our change of destination from France to India he accepted with willing cheerfulness. Although, later, the charge of a hospital ship brought him in contact with Mesopotamia, yet the field of battle did not come his way.

His loss will be felt by all the many with and for whom he lived and worked in Liverpool, and not least by his comrades in the war."

As a memorial to Dr. Owen it has been decided to open a fund to endow one or more beds in the children's ward of the Carnarvonshire and Anglesey Infirmary at Bangor. Subscriptions may be sent to Mr. Pugh, the manager of Lloyd's Bank in that city.

THE LATE DR. J. E. EDDISON.—Dr. Wardrop Griffith, of Leeds, to whom we were indebted for some of the particulars in the obituary notice last week of Dr. J. E. Eddison, writes to say that the date of Dr. Eddison's appointment to the Infirmary was earlier than stated—namely, in 1871. Dr. Griffith did not succeed Dr. Eddison directly; it was Dr. Eddison's resignation that led to his being elected as the junior member of the honorary staff.

Lieut.-Colonel C. T. Samman, Master of the Society of Apothecaries of London, informs us that Dr. DE HAVILLAND HALL, an obituary notice of whom appeared in our columns last week, was a prominent member of the Society's Court of Assistants, where his valued opinions and advice, so courteously expressed, were always listened to with great respect.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent congregations the following degrees have been conferred:—

M.B. and M.Chir.—Francis Howitt Gillett.
B.Chir.—Donald Bagster Wilson.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination held from Jan. 8th to 30th the following candidates were approved in the undermentioned subjects, but are not eligible for the diplomas of the Board:—

Medicine.—Annie F. Allport, Royal Free; J. C. Arthur, Durham; Audrey Z. Baker, Univ. Coll.; S. G. Bedford, Leeds; R. M. Bolam, Cambridge; J. J. Boulle, London; W. V. Bowman, St. Thomas's; Mabel Brewster, Royal Free; T. D. T. Brocklehurst, Guy's; P. P. Chandu Nambiar, Birmingham; A. Clark, London; F. S. Cooksey, King's Coll.; D. M. Craig, Middlesex; H. R. J. Donald, Manchester; F. A. T. Edwards, St. Bart.'s; Lilian P. Edwards, Royal Free; L. M. Edwards, Cardiff and St. Bart.'s; R. G. P. Evans and R. S. M. Fisher, Middlesex; S. K. Foster, Leeds; I. Friedman, R. L. Frost, and D. K. Gaitskell, Guy's; Kathleen E. Gambrell and Alice E. N. Gilby, Royal Free; A. Gilpin, King's Coll.; C. G. Gordon-Wilson, London; Amy L. F. Hankins, Royal Free; K. W. D. Hartley, St. Bart.'s; W. Heard, Middlesex; A. H. Hennessy, Adelaide and London; I. P. G. Howells, St. Mary's; D. Hugo, Guy's; H. P. Hutchinson, St. Bart.'s; D. W. S. Kaye, King's Coll.; M. Kokia, Westminster; J. C. Lee, London; S. D. McClean and E. M. MacLachlan, Guy's; R. G. Mayer, Bristol; I. B. Morris and R. J. L. O'Donoghue, Guy's; Gwendoline Orlebar, Charing Cross; B. J. W. Pilsworth, Royal Free; H. Raj, Birmingham; B. V. P. Reddy, London; J. A. Robson, St. Bart.'s; R. M. Sargent, Univ. Coll.; B. Singer, London; D. B. Smallshaw, Guy's; J. O. Smith, Melbourne; W. H. B. Spoor, St. Thomas's and Bristol; J. B. Sugden, Leeds; R. S. Thomas, A. E. Treweek, and J. J. van Niekerk, Guy's; W. J. Walter, St. Bart.'s; S. N. Wasti, Punjab and London; G. J. S. West, Bristol; S. J. Wheeler, Guy's; Camille Wiseham, Calcutta; and Joyce R. Woods, Royal Free.

Surgery.—E. G. Abdel-Malek, Birmingham; D. A'Brook, Univ. Coll.; S. Alstead, Liverpool; H. F. Apthorpe-Webb, St. Bart.'s; J. C. Arthur, Durham; A. R. Banham, Cambridge and Middlesex; I. T. Barling, St. Thomas's; H. J. W. Bergh, St. George's; D. Bielenky, Westminster; M. Bloom, Cardiff; H. O. Clarke, Dublin; J. R. Colville, St. Bart.'s; P. A. Cooper, Univ. Coll.; W. J. Cotton and D. W. C. Cox, Guy's; D. M. Craig, Middlesex; J. R. Crumbie, St. Bart.'s; F. A. D'Abreu, Birmingham; P. Dalzell, St. Bart.'s; E. C. Dayus, St. Mary's; C. D. D. de Labilliere, St. Bart.'s; Jessie E. Dodds, Sheffield; C. de M. Dorey, St. Mary's; W. J. L. Downing, Middlesex; G. Duckworth, St. George's; D. H. A. Edmondson, Liverpool; B. M. Fonseka, Middlesex; E. S. Fossey, Otago; N. D. Gerrish, Bristol; G. H. A. Graetz, St. Bart.'s; E. Grundy, Leeds; P. N. Hanson, A. G. J. Harris and R. L. H. Harris, St. Bart.'s; H. L. Hoffman, Cambridge and St. Thomas's; J. Hopton, St. Bart.'s; D. Hugo, Guy's; E. F. Hunt, St. George's; April D. James, Bristol; D. S. Jones, St. Bart.'s; R. A. Jones, Univ. Coll.; C. Jotikasthira, St. Thomas's; H. V. Knight and N. Kramer, St. Bart.'s; R. A. Leader, Guy's; J. M. Leggate, Liverpool; F. T. F. Lutter, St. George's; H. G. McGregor, Guy's; F. M. Mallinson, Univ. Coll.; R. B. Mayfield, St. Thomas's; T. J. Millin, Dublin; A. J. Moffett, Birmingham; G. B. Mohile, Guy's; Q. St. L. Myles, St. Thomas's; L. P. Naz, Univ. Coll.; E. J. Neill, Cambridge and St. Bart.'s; S. W. K. Norris and J. R. Owen, Birmingham; W. Pearce, Leeds; F. R. A. Philpott, Oxford and Charing Cross; E. S. Pope and R. K. Price, St. Bart.'s; C. F. H. Quick, St. Mary's; W. Radcliffe, St. Bart.'s; B. Rait-Smith and P. J. Richards, Cambridge and St. Bart.'s; Ivy H. V. Rowlands, Liverpool; C. StJohnston, Birmingham; R. P. W. Shackleton, St. George's; A. R. Smith and J. H. Smith, St. Thomas's; D. Stephens, St. Bart.'s; Mary S. Stuart, St. Mary's; J. B. Sugden, Leeds; L. Sumitra, St. Mary's; D. J. Turnbull and C. E. H. Turner, London; G. S. Walker, Univ. Coll.; J. V. Walker, Birmingham; R. Warnecke, London; J. H. Watkin and T. H. N. Whitehurst, St. Bart.'s; R. L. Whittaker and A. S. Wigfield, Univ. Coll.; E. R. Williams, St. Mary's; J. O. Williams, St. Bart.'s; M. G. Woolff, St. Thomas's; Mary Worthington, Royal Free; B. Wright, Cambridge and St. Bart.'s; P. Yarmarko, Middlesex; and R. H. Young, St. Thomas's.

Midwifery.—H. S. Atkinson, London; E. F. D. Baker, St. Bart.'s; G. Balasuriya, Guy's; A. R. Banham, Cambridge and Middlesex; J. R. J. Beddard, St. Bart.'s; W. V. Bowman, Cambridge and St. Thomas's; A. M. Boyd, St. Bart.'s; Julia A. Boyd, Royal Free; C. E. Brierley, Bristol; H. P. Brody, Sheffield; W. D. Brown, London; A. Buch, St. Mary's; G. H. Buck, Westminster; A. C. Byles, St. Mary's; S. Chopra, Punjab and Edinburgh; Rosa O. J. Clark, Royal Free; G. J. Clarke, Guy's; A. L. Climer and J. R. Colville, St. Bart.'s; F. A. d'Abreu, Birmingham; P. Dalzell, St. Bart.'s; H. B. A. R. Densham, Guy's; M. B. Dixit, Bombay and St. Thomas's; H. R. J. Donald, Manchester; W. J. L. Downing, Middlesex; C. M. Duncan, St. Bart.'s; Lilian P. Edwards, Royal Free; E. G. Evans, Univ. Coll.; I. Q. Evans, St. Bart.'s; M. D. A. Evans, Univ. Coll.; R. S. M. Fisher, Middlesex; G. M. Flemming, St. Bart.'s; B. M. Fonseka, Middlesex; E. S. Fossey, Otago; S. K. Foster, Leeds; D. K. Gaitskell, Guy's; Kathleen E. Gambrell, Royal Free; W. W. Gerrard, Liverpool; S. E. F. Gooding, London; G. H. Greenway, Guy's; V. S. Hariharan, Madras; D. Hay, St. Bart.'s; Geraldine J. G. Hayes, Manchester; Aureval Heaton, Royal Free; H. L. Hoffman, St. Thomas's; R. E. Holmes, London; I. P. G. Howells, St. Mary's; W. V. Howells, London; A. H. Hussein, Cairo and Edinburgh; April D. James, Bristol; N. R. Jeffery, Manchester; J. L. Jekyll, London; D. S. Jones, St. Bart.'s; K. S. Keele, Guy's; S. A. Kelany, Birmingham; H. V. Knight, Cambridge and St. Bart.'s; N. Kramer, St. Bart.'s; E. E. Lewis, St. Mary's; W. E. B. Lloyd, St. Bart.'s; O. V. Lloyd-Davies, Middlesex; F. D. MacCarthy, St. George's; R. W. McConnel, King's Coll.; W. A. R. Mailer, St. Bart.'s; R. G. Mayer, Bristol; R. B. Mayfield, St. Thomas's; T. J. Millin, Dublin; W. J. Moffat, St. Thomas's; A. J. Moffett, Birmingham; E. J. Neill, Cambridge and St. Bart.'s; J. R. Owen, Birmingham; G. A. Y. Parker and A. S. Philps, St. Bart.'s; Betty J. W. Pilsworth, Royal Free; E. S. Pope and C. B. Prowse, St. Bart.'s; T. P. V. Rao, St. Thomas's; W. H. Reynolds, Cardiff; J. A. Rogers, King's Coll.; H. L. Rogerson, St. Bart.'s; A. Said, Birmingham; R. W. Scanlon, St. Thomas's; J. D. Scott, St. Bart.'s; K. M. Seedat, Charing Cross; R. P. W. Shackleton, St. George's; Eileen M. M. Shaw, Westminster; Everell M. Shippam, Royal Free; C. B. Singh, Lucknow; F. J. G. Slater, Cambridge and Durham; C. H. Smith and J. H. Smith, St. Thomas's; J. O. Smith, Melbourne; N. Solomon, St. Bart.'s; L. Tarneja, Univ. Coll.: D. M. Thomas, Cardiff and Middlesex; J. M. Thomas, Cardiff and Univ. Coll.; D. J. Turnbull, London; E. Vitenson, Guy's; G. S. Walker, Univ. Coll.; J. V. Walker, Birmingham; W. W. Walther, Univ. Coll.; J. H. Watkin, St. Bart.'s; G. J. S. West, Bristol; A. J. White, Middlesex; R. L. Whittaker and A. S. Wigfield, Univ. Coll.; E. R. Williams, St. Mary's; J. K. Willson-Pepper, St. Thomas's; Camille Wiseham, Calcutta; Joyce R. Woods and Mary Worthington, Royal Free.

Pathology (New Regs.).—F. I. Ashton, St. Thomas's; D. M. Craig, Middlesex; D. H. A. Edmondson, Liverpool; D. Ezekiel, Charing Cross; R. G. S. Howe, Univ. Coll.; E. Johnson, Manchester; M. Kremer, Middlesex; E. R. G. Passe, London; R. K. Price, St. Bart.'s; B. Ram, St. Thomas's; D. P. Turner, King's Coll.; W. W. Walther, Univ. Coll.; S. J. Wheeler, Guy's; and J. K. Willson-Pepper, St. Thomas's.

UNIVERSITY OF LONDON.—At a meeting of the Senate on Jan. 23rd Mr. H. L. Eason was reappointed representative of the University on the General Medical Council.

The University medal at the M.D. Examination (Branch I Medicine), December, 1928, has been awarded to Horace Joules, of Middlesex Hospital, and the University medal at the M.B., B.S. Examination, November, 1928, has been awarded to Harold Percival Himsworth, of University College Hospital.

Applications will be invited between May 1st and June 15th for grants from the Thomas Smythe Hughes Medical Research Fund for the assistance of original medical research. The Senate will also shortly consider applications for grants from the Dixon Fund for assisting scientific investigations. Further particulars of these funds may be had from the Academic Registrar.

A University studentship in physiology, of £100 for one year, is offered to a candidate suitably qualified for research. Applications must be received in proper form by the Principal Officer by May 31st.

UNIVERSITY OF LIVERPOOL.—Mrs. Adami, widow of the late Vice-Chancellor, Prof. George Adami, has given £100 for the further endowment of the George Adami Prize in Pathology.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—As a result of the terminal examination in the Division of Tropical Medicine and Hygiene of this School, the Duncan medal was awarded to Dr. S. Batchelor.

EUGENICS SOCIETY.—The Galton anniversary dinner will be held at the Rembrandt Hotel, Brompton-road, London, S.W., on Feb. 16th, at 7.15 P.M. The Galton ecture, entitled The Coming of Age of the Eugenics Society, will be delivered by Major Leonard Darwin, Sc.D.

ROYAL MICROSCOPICAL SOCIETY.—A meeting will be held at the house of the society at 20, Hanover-square, London, W., on Feb. 20th, at 8 P.M. Papers will be read on some Effects on Cell Division in vitro of Radium (Dr. R. G. Canti and Mr. F. G. Spear), and of X rays (Miss S. F. Cox). Mr.F. G. Spear will also describe an Effect of Low Temperature on Cell Division in vitro, and demonstrations will be given in connexion with these communications.

ST. ANNE'S HOME SCHOLARSHIP.—The Council of Epsom College will shortly elect a girl to a St. Anne's Home Scholarship of £52 a year. Candidates must be fully 7 years of age and not over 12 years of age on May 1st next, and must be orphan daughters of medical men who have been for not less than five years in independent practice in England or Wales. Application must be made by March 8th, on a form to be obtained from the Secretary of the College, at 49, Bedford-square, London, W.C. 1.

VOYAGE D'ÉTUDES MÉDICALES.—The twenty-second tour of the V.E.M. to French watering places will take place in the Alps during the first fortnight of September, 1929, under the leadership of Professors Paul Carnot, Maurice Villaret, and A. Piéry. After visiting the Faculty of Medicine at Lyons the party will assemble at Vals-les-Bains. The tour will be made by motor coach from Briançon to Evian-les-Bains, where it ends. The spas of the "Briançonnais," "Dauphiné," and "Savoie" will be visited in succession. The detailed programme and cost of the tour will be published later, but further information may now be obtained from Madame Juppé-Blaise, Federation of the Health Resorts of France, 1, Gordon-square, London, W.C. 1.

"THE ANTISEPTIC": SILVER JUBILEE.—Twenty-five years ago the *Antiseptic* was started to meet the needs of the medical profession in South India for scientific medical information by the Hon. U. Rama Rau and the late Dr. T. M. Nair. The former, who is now the editor, has written the story of the journal through a quarter of a century, and has sent us an advance proof of his essay which will appear in the Silver Jubilee issue of the *Antiseptic* in April next. The whole policy of the journal need not be endorsed, while we approve its whole-hearted desire to promote medical reform in India, and the following quotation is a good example of the editor's practical outlook: "The medical profession, in their dealings with the lay public, have a hard time in convincing them of the benefits of fresh air, pure water, nutritious food, good exercise, sound sleep, and a host of other things which are indispensable not only to cure them of their maladies, but also to prevent them from contracting fresh ailments. The lay public consequently require to be educated, too, in matters of health and hygiene, if the medical profession should claim absolute success in their career."

In describing the activities of the journal during the past 25 years, the writer summarises the difficulties under which the I.M.S. worked at the commencement of the wentieth century, and explains the position of the subordinate medical services and their need for reform, pointing out the various changes which the *Antiseptic* considered necessary and which in some cases it may congratulate itself on having successfully brought about. Efforts to put down quackery, to provide the better staffing of the Madras General Hospital, to secure the reorganisation of the subordinate medical department of the Madras Presidency, and the subject of hospital abuse were also matters in which the *Antiseptic* has been strenuously concerned, while it has exhorted members of the medical profession to take a larger part in public life, there being need for more medical men in municipalities, district boards, and legislative councils. "A medical man becoming minister of medicine and public health in a province will be the greatest blessing to the people."

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT (SCOTLAND) BILL.

THE House of Commons went into Committee on the Local Government (Scotland) Bill on Thursday, Feb. 7th, Mr. J. F. HOPE (Chairman of Committees) in the chair.

Power of Delegation to Town Councils of Small Burghs.

On Clause 13 a Government amendment was agreed to providing that a county council might, on such terms and conditions as the councils concerned might agree to, appoint the town council of any small burgh, or the district council of a district within the county, or a joint committee of such a town council and district council of which the members of the county council for the burgh and district should be members, to act as agents of the county council to carry out locally with certain exceptions functions vested in the county council. The excepted functions were those relating to education and police, and it was further provided that a function relating to any form of medical or surgical treatment should only be delegated with the approval of the central department.

The clause was added to the Bill by 195 votes to 102.

Schemes for Administration of Functions.

On clause 14 Major ELLIOT (Under-Secretary of State for Scotland) moved a lengthy amendment which included the following:—

"An administrative scheme may provide that any assistance to which this Sub-section applies, which might after the commencement of this Act be provided either by way of poor relief or by virtue of any enactment other than the Poor-law Acts, shall be provided exclusively under and by virtue of the enactments other than the Poor-law Acts and not by way of poor relief, but nothing in this Sub-section or in any scheme shall diminish or otherwise affect the duty of the council to provide relief for the poor.

"The assistance to which this Sub-section applies shall be the maintenance and treatment of sick persons, including, without prejudice to the said generality, persons suffering from any infectious or other disease, or lunatics or persons mentally deficient, or the provision made for the health of expectant mothers, nursing mothers, or children under five years of age or for blind persons, or for the feeding, clothing, and treatment of school children.

"Every administrative scheme relating to education made by the council of a county within which a large burgh is included for the purpose of education shall, unless the county council and the town council of the large burgh otherwise agree, make provision whereby for the purpose of the medical inspection, supervision, and treatment of the children attending the schools within the burgh, the county council shall utilise to such extent, and on such terms and conditions as the councils agree or, failing agreement, as the Department of Health determine, the medical and nursing staff of the town council, and the clinics and hospitals under the control of that council, and every such scheme which shall be made by the county council, and approved by the department only after consultation with the town council shall be binding upon the town council.

He said that this amendment was of very considerable importance, and would, he thought, be welcomed in all parts of the Committee. It provided for the break up of the poor-law, and it was to be taken in conjunction with a new clause, which would be moved later, dealing with the wide extension of hospital facilities and the provision of hospital facilities other than under the Poor Law Acts for sick persons in cities and counties. There was at present a great bundle of duties of most varying kinds applied to persons in varying circumstances wrapped up together under the heading of the poor-law. This dealt more particularly with one group, that of the sick. This was one of the steps for which it was worth while introducing the Bill. The new clause to which he had referred was most important. It was a step which had been recommended by many committees, and it had been unanimously pressed upon the attention of the Government. It was another forward step in the history of public health in Scotland.

Mr. J. STEWART said that he agreed that there was good in this amendment, but he regretted that the Government had not taken this opportunity to consolidate public health and make it a unified treatment, taking away any degrading conditions, so that it would be as free as the present method of dealing with infectious diseases was free. Under this provision a man who was suffering from epilepsy, acquired through no fault of his own, or suffering from cardiac disease, would be compelled, if he was able, to pay for treatment, and if he was not able his child, or someone else who was connected with him in a degree which made the burden legal, would be compelled to pay. He (Mr. Stewart) hated this proposal, and he wished that every member of the Committee hated it as he did.

After considerable debate,

Mr. WESTWOOD moved an amendment to the amendment which would have the effect of making the Government's proposals mandatory and not permissive.

Sir J. GILMOUR (Secretary of State for Scotland) said that it was not possible to make the proposals purely mandatory. They would enable a local authority to produce a scheme, after consultation with all the voluntary institutions in its district, to take into poor-law institutions cases that were at present outside that system. It opened a way to the complete revision and break up of the present system.

The amendment to the amendment was negatived by 197 votes to 107, and the Government amendment was agreed to.

Clause 14 was added to the Bill.

THE LOCAL GOVERNMENT BILL.

On Tuesday, Feb. 12th, the Local Government Bill was considered on Report.

Administrative Schemes.

On Clause 4 Mr. WITHERS moved an amendment providing that a county council, in the preparation of any scheme relating to hospitals, should consult with the representative of the voluntary hospitals in the area, with a view to coöperation in the treatment of the sick and the avoidance of overlapping. He said that he wished to secure that there should be consultation between the Public Assistance Committees when formed and the voluntary hospitals. His object was to provide the most efficient service for the sick when the scheme came into operation. The voluntary hospitals had a very high standard of efficiency in their technical work, and there was an admirable spirit behind that work. When the county councils took over the local infirmaries it was very important that there should be coöperation between what would be the county council hospitals and the voluntary hospitals. Otherwise there would be overlapping, and trouble would arise. It must be disastrous to the voluntary hospitals if the impression was given that those two classes of hospitals were in competition. It was very important that they should work together in harmony and that it should be understood that the one was not going to supersede the other.

Major GLYN seconded the amendment.

Mr. CHAMBERLAIN (Minister of Health) said that any county council in preparing a scheme must have regard to the voluntary hospital provision already existing in the area. It was obvious that no scheme which proposed to deal with the hospital services of an area could really be adequate unless it took account of existing accommodation in the voluntary hospitals. He was, therefore, in full sympathy with the general idea of Mr. Withers that there should be consultation and coöperation between the two classes of hospitals; but he did not think it would be possible to insert this particular amendment. If they were to provide for consultation with representatives of the voluntary hospitals, logically they could not stop there. There were other voluntary associations doing work on parallel lines with some of the work which it would be the duty of the county councils to perform, and if they were to consult with the representatives of the voluntary hospitals it would only be logical to say that they must consult also with representatives of those other associations. Another practical difficulty was that neither the voluntary hospitals nor those other bodies were organised. There was no system by which they could as a body consult with the county council, and therefore to make that a statutory provision would be a mistake. His view was that consultation and coöperation would take place between the voluntary hospitals and the public authorities, but it would not be acceptable to the local authorities if Parliament were to try to lay down precisely how that consultation and coöperation should be carried out.

Mr. E. BROWN said he regretted that the Minister of Health could not accept the amendment. It was very important that the voluntary hospitals should be considered in any scheme of reorganisation.

Major GLYN said that in rural areas a very large number of workers had long been contributing each week to the voluntary hospitals, and it would be hard upon them if the scheme did not take into account the enormous amount of work which had been done in consequence of their contributions. Those interested in hospital work felt that some organisation—even if it had to be created ad hoc—ought to be taken into consultation in connexion with this scheme.

Mr. WEDGWOOD BENN, in supporting the amendment, pointed out that under the safeguarding provisions the Government taxed drugs used by hospitals. Two days ago a document was published saying that the assessments of hospitals were to be raised.

Sir R. SANDERS said that on almost every county council there was someone who represented the voluntary hospitals and who looked after their interests.

Colonel GRETTON said that, as one who had a great deal to do with the administration of two local hospitals, he wished to urge Mr. Chamberlain to accept the amendment. The large hospitals in the country, no less than those in the Metropolis, ought to be taken into consultation in these matters because they were schools of medicine; they provided the ground where the medical profession received its training, and they would not be superseded by the system which the Minister had set up.

Mr. HARRIS said that the London County Council had already considered this problem so far as London was concerned, and their way was comparatively easy. They had the King Edward Hospital Fund in London, and had an immense opportunity of making something like a perfect hospital system for the metropolitan area.

The amendment was negatived without a division.

VIVISECTION.

On Feb. 7th Lieut.-Commander KENWORTHY presented a petition signed by 9829 persons "praying that the House do prevent the practice of vivisection, believing that it is wrong to inflict pain and disease on living animals."

HOUSE OF LORDS.

THURSDAY, FEB. 7TH.

PROTECTION OF ANIMALS AMENDMENT BILL.

Lord BANBURY moved the third reading of the Protection of Animals (Amendment) Bill.

The Marquess of SALISBURY (Lord Privy Seal) said the Government had been placed in a great difficulty over the Bill. They were unwilling to oppose it, partly out of consideration of Lord Banbury, and partly because its main object was to prevent the odious crime of cruelty to dogs. But from the beginning they were convinced that the Bill was unworkable. Some of the amendments which had been passed made it more unworkable still, and on the whole the Bill was not likely to prove an effective piece of legislation. The procedure of the Bill was not only ineffective but cumbersome. He contended that the procedure was not justified by the small number of cases of cruelty to dogs which occurred in Great Britain.

After some discussion the Bill was rejected on a division by 24 votes to 18—majority against, 6.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 6TH.

Hygiene on British Ships.

Dr. VERNON DAVIES asked the President of the Board of Trade if it was proposed that the joint committee recently set up by the Minister of Health and himself should inquire into the question of hygiene of crews' spaces, with a view to reporting on the sufficiency and efficiency, or otherwise, of the existing sanitary code to secure a reasonable standard of sanitary requirements for all British ships.—Mr. HERBERT G. WILLIAMS (Parliamentary Secretary to the Board of Trade) replied: The question of crew spaces on board ship is within the scope of the joint advisory Committee set up by the Ministry of Health and Board of Trade, and a special series of reports on the subject have been placed before the Committee for their consideration.

Dr. VERNON DAVIES asked the President of the Board of Trade if he had received representations from the Society of Medical Officers of Health, the Royal Sanitary Institute, the Merchant Service Guild, and the Association of Port Sanitary Authorities, stating that the conditions under which merchant seamen were housed on British ships were, from a hygienic standpoint, unsatisfactory and inferior to those on ships of similar tonnage of certain other nationalities; and what reply he had returned.—Mr. HERBERT G. WILLIAMS replied: Representations have been received from one of the bodies mentioned. No detailed reply was sent, but those representations will be considered in connexion with any amendment of the crew space regulations, which are now under review. The conditions on some British ships, especially some of the smaller and older ships, cannot be regarded as satisfactory, and the conditions on some foreign ships are very good; but it is misleading to suggest that crew spaces on British ships generally are unsatisfactory from the hygienic standpoint and inferior to those on foreign ships.

Dr. DAVIES also asked the President of the Board of Trade if he was aware that during 1917 and 1918 the Board of Trade possessed statutory powers to decide the type and position of crews' spaces on British merchant ships; to insist upon the provision of such amenities as two-berth cabins, mess rooms, bath and wash rooms, drying rooms, outside oilskin lockers, and hospital room, as well as to

compel w.c. accommodation as a matter of necessity and without consideration respecting tonnage reductions; that these powers were not at present being enforced; and if he proposed to take any steps to restore these war-time amenities to merchant seamen in British ships.—Mr. HERBERT G. WILLIAMS replied: The statutory powers of the Board of Trade in this matter have not changed, and any changes made in the instructions have been in the direction of requiring a higher standard. I may add that many owners go considerably beyond the minimum requirements.

The Poison Gas Protocol.

Sir ROBERT THOMAS asked the Secretary of State for Foreign Affairs whether he was not prepared immediately to ratify the poison gas protocol of the League of Nations, he would announce through the League that ratification by this country might be regarded as coming automatically into force as soon as the other signatories had ratified it.—Sir A. CHAMBERLAIN replied: It has been announced on more than one occasion in this House that H.M. Government are not prepared to ratify the Gas Protocol unless all the other signatories are ready to do so. The position taken by H.M. Government is thus a matter of common knowledge, and I do not consider that any further pronouncement would lead to any useful results.

THURSDAY, FEB. 7TH.

Maternity and Child Welfare Grants.

Sir ROBERT NEWMAN asked the Minister of Health, with regard to the schemes which had been submitted to the Ministry by county boroughs and other local authorities for building new maternity and child welfare centres, whether in cases where the schemes had been already approved by the Ministry on the principle of a 50 percentage grant, that undertaking would be adhered to by the Ministry, if the local authority so desire it.—Mr. CHAMBERLAIN replied: No, Sir. The grants for maternity and child welfare other than the training of midwives and health visitors will be wholly discontinued after March 31st, 1930, and will be absorbed in the new grants to be given under the Bill.

Cancer Mortality.

Mr. R. MORRISON asked the Minister of Health if he would give the figures, to the last available date, of the number of deaths from cancer of men, women, and children respectively.—Mr. CHAMBERLAIN replied: The most recent figures available are those for 1927, in which year the deaths from cancer in England and Wales were:—

Children under 15 years of age ..	213
Males of 15 years of age and over ..	24,946
Females ,, ,, ,, ,, ..	28,919
Total, all ages and sexes	54,078

Criminal Lunatics.

Sir HARRY BRITTAIN asked the Home Secretary (1) whether, in deciding as to the release or detention of a criminal lunatic, the Home Office was guided solely by medical considerations or if other considerations were likewise included; and whether the opinion of the medical superintendent of the asylum was alone considered or whether that of an independent man was obtained; and (2) whether there were periodical or any examinations of criminal lunatics with a view to ascertaining if they were still of unsound mind and, if so, by whom were such examinations made; and how many, if any, criminal lunatics had during the last ten years been discharged as cured or been transferred to some other home or institution respectively.—Sir W. JOYNSON-HICKS replied: The Secretary of State has regard to all the circumstances. So far as medical considerations are concerned, he is guided mainly by the view of the skilled medical authorities at Broadmoor Criminal Lunatic Asylum—or, if the patient be in a local mental hospital, by the views of the superintendent and of his own medical advisers. All criminal lunatics are constantly under skilled medical observation, and reports on each of them are made to me, both periodically and upon occasion, by the superintendents of the asylums. As the Secretary of State has regard to all the circumstances, and not to medical considerations alone, discharge does not depend entirely upon any single definite factor such as entire recovery or complete cure, nor does transfer from one institute to another necessarily connote cure or recovery. The figures asked for cannot therefore be given.

The Purchase of Radium.

Mr. ROBERT MORRISON asked the Minister of Health, in view of the fact that the Swedish nation had recently purchased six grammes of radium sulphate at an approximate cost of £10,000 per gramme, whether he would inquire into the possibility of a similar purchase being made by his department, thus effecting a saving of £2000 per gramme on the price of £12,000 at present being charged to British purchasers.—Mr. CHAMBERLAIN replied: I have seen press reports to the same effect as the first part of the question. I have no funds at my disposal for the purchase of radium, but the whole question will be considered by the Government when the report of the subcommittee of the Committee of Civil Research has been received.

Geneva Opium Convention.

Sir ROBERT GOWER asked the Home Secretary which of the member States of the League of Nations had ratified the Geneva Opium Convention, and which of them had declined or neglected respectively to do so.—Mr. G. LOCKER-LAMPSON (Under-Secretary for Foreign Affairs) replied: The Geneva Opium Convention has been ratified in respect of all parts of His Majesty's Dominions except the Irish Free State. Of the other members of the League of Nations I understand that the following have ratified, or acceded without qualification:—Austria, Belgium, Bulgaria, Czecho-Slovakia, Dominican Republic, Finland, France, Japan, Latvia, Luxemburg, Netherlands, Poland, Portugal, Roumania, Salvador, and Spain; and the following have signed, or acceded subject to ratification, but have not so far ratified:—Albania, Bolivia, Chile, Cuba, Denmark, Germany, Greece, Hungary, Italy, Nicaragua, Persia, Serb-Croat-Slovene State, Siam, Switzerland, Uruguay, and Venezuela.

MONDAY, FEB. 11TH.

Radium and the Treatment of Cancer.

Mr. ROBERT MORRISON asked the Minister of Health whether it had now been decided to recognise North Middlesex Hospital as the centre available for radium treatment for Middlesex; and, in view of the large mortality from cancer, whether he would take steps to speed up the arrangements necessary so that the work might commence at an early date.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend has approved arrangements under which the Edmonton Board of Guardians will obtain a supply of radium for the treatment of particular forms of cancer at the infirmary of the guardians which is known as the North Middlesex Hospital, and one of the terms of the arrangement is that in so far as the radium may not be in use for persons chargeable to the guardians, it shall be used for similar cases from other unions in the adjacent parts of Middlesex. There has been and will be no avoidable delay on my right hon. friend's part in bringing the arrangements into operation.

Import Duty on Radium Compounds.

Mr. WEDGWOOD BENN asked the Secretary to the Treasury whether radium and radium compounds were at present subject to an import duty; and, if so, at what rate.—Mr. A. M. SAMUEL replied: The item "radium compounds" is included in the list of chemicals liable to a duty of 33⅓ per cent. ad valorem issued by the Board of Trade under Part I. of the Safeguarding of Industries Act, 1921, but these compounds are exempted from duty until June 30th, 1929, by Treasury Order made under Section 10 (5) of the Finance Act, 1926. Radium is not dealt with commercially except in the form of a compound.

TUESDAY, FEB. 12TH.

Nervous Diseases among Telephonists.

Sir ROBERT THOMAS asked the Postmaster-General what number and percentage of girls employed in telephone exchanges in London during the past year had been recorded as suffering from nervous complaints, slight or serious; what was the maximum continuous period of duty during the busy hours of the day; and what was the maximum number of lines allotted to one attendant.—Sir W. MITCHELL-THOMSON replied: A considerable amount of time and Labour would be required to furnish the information asked by the hon. baronet; but I am in a position to give corresponding figures for 1926. In that year, out of 79,712 days of sick leave taken by London telephonists; 4193 days were attributed to neurasthenia, nervous debility, nervous exhaustion, nervous shock, and neurosis; 385 days to neuritis; 1592 days to neuralgia. The total number of telephonists employed was 7051, but there is no record of the number of telephonists who were absent on account of these disorders. The normal maximum continuous period of duty covering the busy hours of the day is three and a half hours. This is sometimes extended to four hours; but the duty in either case includes some time outside the busy period. The number of lines allocated to any one operator varies from 60 to 260, the average number being 120.

Protection against Gases in War Time.

Mr. ROBERT MORRISON asked the Prime Minister whether any scheme would be issued to local authorities and others concerned for the protection of town populations from

chemical gases in future warfare, providing for gas-proof rooms, flushing of streets with appropriate chemicals, decontaminating clothing, and providing first-aid and removals to hospitals; and what steps were being taken to provide the necessary preliminary training in these matters.—Mr. BALDWIN replied: The problem of the protection of the civil population against air attack is being closely studied in all its aspects, including those specifically referred to in the question by the hon. Member. The need for the preliminary training of personnel and for the preparation of full and precise instructions to all concerned is not being overlooked.

Appointments.

COBB, J. H., M.B., B.S. Lond., F.R.C.S. Eng. & Edin., has been appointed Surgeon to the Ear, Nose and Throat Department of Sheffield Royal Infirmary.

MACINTYRE, E. J., M.B., Ch.B. Glasg., Assistant Tuberculosis Officer, Bermondsey.

TAYLOR, W., M.D., Ch.B.,Aberd., D.P.H., County Medical Officer of Health for Salop.

WITTS, L. J., M.D. Manch., L.R.C.P. Lond., Assistant to the Medical Unit of the London Hospital, Assistant Physician to Guy's Hospital.

Paddington Green Children's Hospital: ELLIS, V. H., M.B., B.Chir. Camb., F.R.C.S. Eng., Honorary Surgeon to Out-patients; MCLAGGAN, J. D., M.B., Ch.B. Aberd., F.R.C.S. Eng. & Edin., Additional Honorary Surgeon to Ear, Nose and Throat Department.

Sheffield Royal Hospital: STONE, DORIS M., M.D. Lond.,D.P.H., full time Assistant Pathologist; CALLCUTT, J. SHIRLEY, M.B., Ch.B., Resident Surgical Officer; HYNES, W., M.B., Ch.B., Senior Casualty Officer; PATTERSON, W. J., M.B., B.Ch., and RAINSFORD, C., M.B., B.Ch., House Surgeons; MAXWELL, C. G., M.B., B.Ch., and GUMPERT, T. E., M.B., Ch.B., House Physicians; ALCOCK, W., M.B., Ch.B., and LAVERY, M. B., M.B., B.Ch., Assistant House Surgeons; ROSENFIELD, E., M.B., B.Ch., Ophthalmic House Surgeon; FROGGATT, G. H. V., L.R.C.P., M.R.C.S., Aural House Surgeon; and STEWART, W. J., M.B., B.Ch., Resident Anæsthetist.

Certifying Surgeons under the Factory and Workshop Acts: FLOOD, J. W., L.R.C.P.I., L.R.C.S.I. (Crosby, Lancs); GORDON, J. D., M.B., Ch.B. Aberd. (Bolsover); WILLIS, T. G., L.R.C.P. Lond., M.R.C.S. (Wendron, Cornwall).

Vacancies.

For further information refer to the advertisement columns.

Basutoland.—M.O. £550.

Bath, Royal United Hospital.—H.P., H.S., also Asst. H.S. At rate of £120 and £100 respectively.

Bethnal Green Metropolitan Borough.—M.O.H. £1000.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £120.

Bristol Royal Infirmary.—H.P.'s, H.S.'s, Dental H.S., &c. Each at rate of £80.

Cancer Hospital, Fulham-road.—Director of Electrical and Radio-Therapeutic Dept.

Cardiff Royal Infirmary.—Ophthalmic H.S. At rate of £75.

Cardiff, University College of South Wales and Monmouthshire.—Lecturer and Demonstrator in Anatomy. £400.

Carlisle, Cumberland Infirmary.—H.P. and H.S. Each at rate of £155.

Chester Royal Infirmary.—Hon. Asst. Surgeon.

Dorchester, Dorset Mental Hospital.—Sen. Asst. M.O. £400.

East African Medical Service.—M.O.'s and Health O.'s. £600 and £660 respectively.

Glasgow, Hawkhead Asylum, Crookston.—Jun. Asst. M.O. £275.

Gloucester County Mental Hospital.—Jun. Asst. M.O. £350.

Gloucester, Gloucestershire Royal Infirmary.—2nd H.S. At rate of £100.

Grove Park Hospital, Lee, S.E.—Jun. Asst. M.O. £500.

Guy's Hospital Medical School.—Gull Studentship in Pathology and Allied Subjects. £250.

Hertford County Hospital.—Res. Surg. O. At rate of £250.

Hong-Kong.—M.O. £600.

King Edward Memorial Hospital, Ealing.—Secretary-Supt. £400.

Leeds, General Hospital.—Two Anæsthetists. £25.

Leicester Royal Infirmary.—Preliminary notice of expected vacancies. At rate of £125.

Liverpool, David Lewis Northern Hospital.—H.S. for Orthopædic, &c. At rate of £100.

L.C.C. Mental Hospital Service.—Eighth Asst. M.O. £300.

Lucknow University.—Professorship of Medicine and Physician to King George's Hospital. Rs.1200–50–1400 p.m.

Manchester, Ancoats Hospital.—H.S. Orthopædic. £100.

Manchester and Salford Hospital for Skin Diseases.—H.S. £100.

Manchester, Victoria Memorial Jewish Hospital.—Sen. H.S. £250.

Miller General Hospital for South East London, Greenwich-road, S.E.—Res. M.O., Cas. O., and H.P. At rate of £250, £150, and £125 respectively.

Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. H.S. At rate of £100. Also Res. H.P. and Res. H.S. Each at rate of £95.

Newport, Mon., County Borough Mental Hospital.—Asst. M.O. £300.

Northern Rhodesia.—M.O. £600.

Queen's Hospital for Children, Hackney-road, E.—Anæsthetist. £25. Also Res. M.O. £200.

Rampton State Institution for Mental Defectives, near Retford.—M.O. £536 10*s.*

Richmond, Surrey Royal Hospital.—Refractionist. £50.

Rotherham Hospital.—H.P. £180.

Royal Dental Hospital of London, 32, Leicester-square, W.C.—Two Hon. Asst. Anæsthetists.

Royal London Ophthalmic Hospital, City-road, E.C.—Sen. H.S. At rate of £150.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—H.S. Also H.S. for Country Branch at Stanmore, Middlesex. Each at rate of £150.

St. John's Hospital for Diseases of the Skin, Leicester-square, W.C.—Sen. and Jun. Hon. Med. Registrars.

Sheffield, Royal Infirmary.—Vacancy on Hon. Surgical Staff.

Southampton, Royal South Hants and Southampton Hospital.—Sen. H.S. £175, H.P. £130, Jun. H.S. At rate of £130. Also Cas. O. At rate of £120.

Surrey Administrative County of.—County M.O.H. £1800.

Surrey, County Council.—Asst. M.O. £600.

Torquay, Torbay Hospital.—H.P. £150.

Warwick County Mental Hospital, Hatton.—Jun. Asst. M.O. £350.

West Bromwich and District General Hospital.—H.S., H.P. Also Cas. H.S. Each at rate of £200.

Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.—Hon. Sen. Dental Surg., Hon. Dental Surg. Also Asst. Phys. to the Radiological Dept. £50.

Births, Marriages, and Deaths.

BIRTHS.

BUTTER.—At 5, St. Albans-road, N.W.5, on Feb. 8th, to Dr. and Mrs. A. J. M. Butter—a son.

GEBBIE.—At "Branscombe," Davenport Park, Stockport, on 5th inst., to Helen Young Murdoch, M.A., M.B., Ch.B., and Nicolas Gebbie, M.D., D.P.H.—a son.

MOODIE.—On Feb. 9th, at Dudley House, Beaumont-street, W., the wife of William Moodie, M.D., M.R.C.P., of a daughter.

MURPHY.—On Jan. 20th, at The Beeches, Middlewick, the wife of James Murphy, F.R.C.S., of a daughter.

ROBERTSON.—On Feb. 10th, at The Mount, York, the wife of Dr. Douglas A. Robertson, of a daughter.

MARRIAGES.

FAWKES—GREEN.—On Feb. 9th, at St. Matthew's, Ealing Common, Roland Beattie Fawkes, D.S.O., M.A., M.R.C.P., to Beryl Constance, eldest daughter of Mr. and Mrs. Walter Green, of Ealing, W.

DEATHS.

ANDERSON.—On Feb. 2nd, at Twyford, Winchester, Deputy Inspector-General I. H. Anderson, M.D., R.N. (retired), aged 80.

BLACKBURN.—On Feb. 11th, at Arncliffe, Half Edge-lane, Eccles, Harriet, the dearly loved wife of A. E. H. Blackburn, Ph.C., Honorary Visiting Apothecary to the Manchester Royal Infirmary, Salford Royal Hospital, and St. Mary's Hospitals.

GEORGE.—On Jan. 31st, at Margate, Howard Trevelyan George, M.R.C.S., L.R.C.P. Lond., late Senior Chief Assistant, X Ray Department, St. Bartholomew's Hospital, and Hon. Medical Officer in Charge, X Ray Department, St. Andrew's Hospital, Dollis Hill, London.

JACOB.—On Feb. 1st, at St. Helier, Jersey, Archibald Hamilton Jacob, L.R.C.P.I., L.R.C.S.I., late Temporary Captain, R.A.M.C., and Tuberculosis Officer, Essex County Council, aged 61.

MORIER.—On Feb. 2nd, at Maida Vale-mansions, W., Dr. Charles George Drummond Morier.

PATCH.—On Feb. 7th, at a nursing home, Henry Herbert Lloyd Patch, L.R.C.P., M.R.C.S., aged 59.

STEWART.—On Feb. 10th, at Redcliffe-gardens, S.W., Howard Douglas Stewart, M.R.C.S., L.R.C.P., L.S.A. aged 78.

TOLMIE.—On Feb. 5th, at Burnt Ash-road, Lee, Kent, James Alexander Tolmie, M.A., M.B., D.P.H.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Notes, Comments, and Abstracts.

THE BUNAU-VARILLA SYSTEM OF WATER PURIFICATION.

By T. H. Bishop, M.R.C.S. Eng., D.P.H.,
CHIEF MEDICAL OFFICER, EASTERN BENGAL (STATE) RAILWAY.

THE first report [1] published by Dr. Téchoueyres, director of the Bureau of Hygiene and professor at the School of Medicine of Rheims, regarding the working of the newly installed plant for the treatment of the public water-supply to that city, may be said to have removed the Bunau-Varilla system of purification from the category of experimental to that of proved water treatment methods. Until its installation at Rheims it had been tested only on a small scale under war conditions so that its adaptation to a large municipal service was something of a venture. Dr. Téchoueyres's opinion of its value must be given in his own words. He writes:—

"Je puis déclarer aujourd'hui—après un an d'usage—que la ville de Reims a réalisé l'installation la moins onéreuse, la plus simple et la plus parfaite en adoptant l'appareil auto-javelliseur de M. Philippe Bunau-Varilla."

Following Rheims, a number of other French municipalities are now adopting the process with equally satisfactory results, and this increasing popularity is additional proof of its efficiency. It is probable, therefore, that many, besides those professionally occupied with water purification, may find interest in a brief account of this new departure which is sufficiently revolutionary in principle to suggest a reconsideration of many older methods.

The special features of the system cannot be stated more clearly than Dr. Téchoueyres has given them in his report, where he claims that "the originality of the method of M. Bunau-Varilla lies not only in the use of an automatic apparatus but also in the employment of effective doses of sodium hypochlorite which are well below the strength of such as may be perceived by the taste; that, in short, it is capable of purifying a water without depriving it of its natural agreeable qualities."

The Story of its Origin.

Before proceeding to describe the process it will be convenient to refer briefly to the circumstances in which it was devised, which emphasise the technical ability, enterprise, and courage of its author.

During the disastrous autumn of 1916, when France was exploiting every resource to minimise the depletion of her Forces in the gallant struggle to hold the enemy before Verdun, Commandant Philippe Bunau-Varilla, a civil engineer of considerable repute in his profession, found himself responsible for the water service of the 2nd Army which constituted the Verdun defence. The regulations for treating the field water-supplies had been published in a general army order and, as in the case of the Horrock formula, used by British sanitary units, prescribed a dosage calculated to ensure the presence of available chlorine after preliminary absorption tests had been made. The result seems to have been even less appreciated by the French troops than by the British, for, although the average dose of the disinfectant was only 0·06 parts per million greater, the attitude of the men for whose drinking-water supplies he was responsible thoroughly convinced Commandant Bunau-Varilla that the official instructions in regard to this matter could not be carried out. Yet, on the other hand, there could be no possible doubt about the necessity for purification, as samples from the wells adjacent to the front line—the only possible sources of supply—showed the presence of colon bacilli in alarming numbers.

One can readily appreciate the gravity of such a situation, and it is not surprising that it led an officer as zealous and capable as Commandant Bunau-Varilla to thoughtful speculation concerning this method of water purification. Could safety not be attained without coincident nausea? Were the massive doses which produced such a result entirely necessary? The terrible casualties incidental to the defence operations seem to have provided the opportunity for obtaining answers to these questions. An evacuation hospital was required at Fleury-sur-Aire, and its personnel included the chief of the medical laboratory of the 2nd Army—Major Cathoire. To him Commandant Bunau-Varilla carried his problem, suggesting a series of experiments on polluted water samples to ascertain the bactericidal action of minute doses of available chlorine ranging from one decimilligramme per litre up to the minimal official dose of one milligramme per litre. Major Cathoire confesses that he considered the suggested investigation foredoomed to failure in so far as it might be expected to warrant any departure from the official practice, but the zeal and persistence of his brother officer prevailed and he undertook the tests. His earliest results aroused his own interest in the inquiry as they showed an almost complete destruction of the colon bacilli (1000 per litre) in the Fleury-sur-Aire water with a dose of *eau de Javelle* giving 1·0 decimilligrammes of available chlorine, and this destruction became complete when the available chlorine was increased to 1·3 decimilligrammes per litre (0·13 parts per million). Similar experiments were made with samples of the Bar-le-Duc water which contained 33,000 colon bacilli per litre, and here the results were even more remarkable, as complete disappearance of the colon bacilli was secured with a dose of 0·8 decimilligrammes of available chlorine (0·08 parts per million).

The investigation and the results obtained were reported to army headquarters and, without any loss of time, Commandant Bunau-Varilla proceeded to reorganise the water purification arrangements at the 2nd Army depôts. The army water plant was adapted for the use of "doses infinitesimales" and an ingenious contrivance added which secured an automatic supply of the reagent.

Believing that the limit of the bactericidal action of *eau de Javelle* had not been reached, further experiments were made with the water-supply to the Chateau of Souilly—the seat of the headquarter's staff of the Verdun army—and complete elimination of the small colon bacilli content was attained with a dose of one-fiftieth of a milligramme of available chlorine per litre (0·02 parts per million).

Mr. Bunau-Varilla had the misfortune to be seriously wounded shortly afterwards, but the report he had submitted led to the appointment of a scientific commission which repeated and confirmed the experiments of Major Cathoire so far as these dealt with samples of clear water. The commission then proceeded to make similar tests on samples of water charged with organic matter and muddy, with the result that they did not obtain complete destruction of all colon bacilli, but noted a constant marked diminution in their number. The work of this commission was closely followed by the chief of the military epidemic service Prof. Dopter, who later, conjointly with Prof. Rieux, of Val-de-Grâce, made the report public in a communication to the Academy of Medicine of Paris, where, after a description of the improvements which Commandant Bunau Varilla had made in the army water treatment apparatus they stated: "This apparatus has been in use at all the water depôts established by the 2nd Army, and at some of those of the 4th Army, and although the amount of free chlorine provided for by the author of the process is so extremely small the system has given entire satisfaction."

The prolonged and serious illness of Mr. Bunau-Varilla probably prevented any immediate further exploitation of his valuable work, and it seemed improbable at one time that the process would ever be applied on a large scale, when by a stroke of good fortune it came to the notice of Dr. Téchoueyres who, as director of the bureau of hygiene of Rheims, was faced with one of the many health problems which the war created for France. The devastation caused by the prolonged and fierce bombardment to which Rheims was subjected made it necessary for the returning population to select sites for their new dwellings further afield and, in fact, suburbanisation occurred to such an extent that the wells from which the city had hitherto drawn a quite satisfactory water-supply now came within the area of pollution. Keenly alive to the danger which these altered conditions threatened, Dr. Téchoueyres brought the matter to the attention of the municipal authorities. "On chercha," he writes, "un procédé qui guarantît les eaux potables contre une surprise de pollution tout en leur laissant leur goût agréable, et en ne créant aucune charge pécunaire excessive." As mentioned, good fortune brought him into touch with Mr. Bunau-Varilla who undertook to design a plant embodying the principles of his system for the Rheim supply of 3 to 4,000,000 gallons a day. When it is stated that the plant which has now been working for two years cost only 3000 francs (say £30)* to instal and about sixpence per 1,000,000 gallons for running charges, it may be admitted that on the score of economy the choice of process could hardly have been bettered.

Description of the Apparatus.[2]

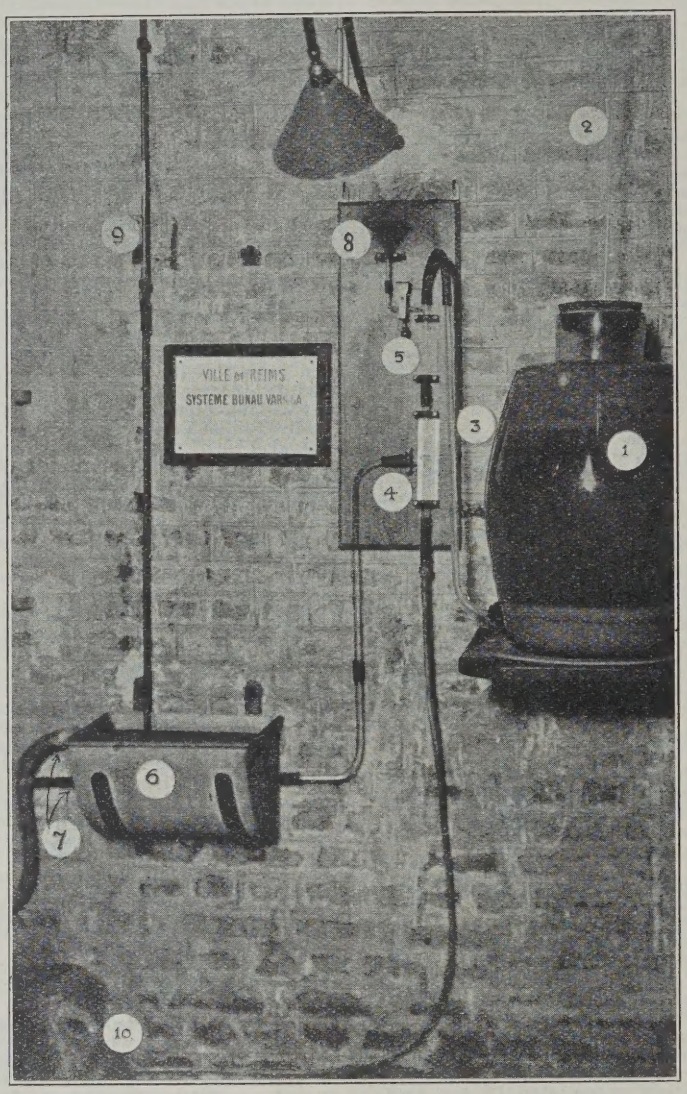
The accompanying photograph will show the simplicity of the mechanism. The partshave been numbered for easy reference.

The apparatus consists of a glass barrel reservoir (1) for diluted *eau de Javelle* solution,† the necessary amount of dilution being determined by the formula given. The reservoir is corked but an air-inlet tube (2) allows atmo-

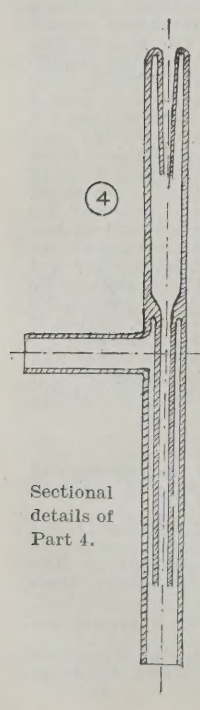
* Mr. Bunau-Varilla has neither patented his apparatus nor accepted any fee for its design.

† *Eau de Javelle* is a solution of NaCl and NaOCl, of variable strength, which can be procured in almost every village in France.

spheric pressure to act on the fluid level at the same time that it minimises loss of strength of the reagent. In operation the fluid is conducted through a bent glass tube (3) to a point (4) termed the *bifurcateur trompe*, where it meets a stream of water which dilutes it further, so that on reaching the water main into which it is discharged a dose of available chlorine of 1 decimilligramme per litre (0·1 parts per million) is provided. The relative quantities of reagent and diluent are also controlled by causing the former to pass through two calibrated constrictions (5) of 5/10 and 8/10 mm. respectively. The stream of diluting water is delivered at constant pressure after passing through an open trough (6), the level of which is maintained by the device of a surplus feed and two waste outlets (7), one at a higher level than the other. An arrangement for bringing a minute quantity of HCl to dissolve any solid particles which may come over and block the flow of the reagent is provided (8), but this technical difficulty does not appear to arise in actual practice. Automaticity is ensured by linking up the pump starter with a valve on the pipe through which the water supplying the pressure-regulating trough passes. The flow throughout the apparatus is excited by suction induced at the point (10) where the disinfecting fluid finds entrance to the water main.



The Bunau-Varilla system installed at Rheims.



Sectional details of Part 4.

My inspection of the Rheims plant left the impression of an extremely simple, effective, and easily supervised contrivance.

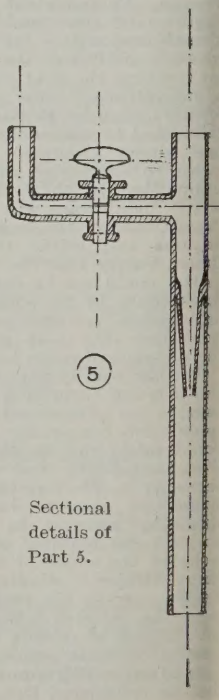
Special Features of the Process.

It is probable that when the urgent need for obtaining a safe and acceptable drinking water-supply for the Verdun troops caused Mr. Bunau-Varilla to speculate regarding the dose of chlorine which was required for purification he was unaware of the work which had been done by other investigators in regard to the same problem and, possibly, he has congratulated himself since on his opportune ignorance, for there can be few problems which have evoked such widely differing opinions. At the one extreme is Nissen of the Berlin Hygienic Institute, whose experiments required 420 parts per million of available chlorine to produce sterilisation in one minute, and half that amount to effect it in ten minutes, and at the other extreme is the careful work of Race,[3] of Ottawa, who found that a suspenon of 1000 colon bacilli per c.cm. could be reduced to the 2 bacilli standard in ten minutes, in a water from which organic matter was absent, with 0·1 parts per million. For the London water-supply the dose employed is slightly more than 0·5 parts per million, but in this case the reagent is added prior to filtration.[4] The practice of Mr. Dienert, of the Paris Water Service, is to make a preliminary absorption test and then to add 2 decimilligrammes of available chlorine per litre. This is for a contact period of three hours. The methods followed in the treatment of other large public supplies further indicate the diversity of opinion which exists, but the story of the legal battle which was occasioned by the experiments on the Boonton portion of the supply to Jersey City, U.S.A., would probably have heartened Mr. Bunau-Varilla had he known it in those anxious days. As long ago as 1908 Mr. G. A. Johnson and Prof. Leal, being associated in a scheme for treating the Boonton supply, followed a policy of employing gradually reduced doses until they had decreased these from an initial dose of 1·4 parts per million of available chlorine to 0·2 parts per million. At this point the city authorities seem to have taken fright and the law was invoked. The judgment is worth quoting from.

"From the proofs taken before me," announced the court, "of the constant observation of this device I am of opinion and find that it is an effective process which destroys in the water the germs, the presence of which is deemed to indicate danger, including the pathogenic germs, so that the water after this treatment attains a purity much beyond that attained in water-supplies of other municipalities. The reduction and practical elimination of such germs from the water was shown to be substantially continuous."

Possibly had this story been better known generally, and more work done on the lines followed by the Rheims investigators, the system of Mr. Bunau-Varilla would not have had to wait so long for its début.

It is to be observed, in appreciation of the part which Dr.



Sectional details of Part 5.

Téchoueyres has played in the evolution of this process, that its adoption for the Rheims public supply was not decided upon without very careful consideration, and some noteworthy experimental work has been done at the Reims public health laboratory which, in his opinion, has established several important facts serving to explain the process scientifically. The first of these facts is the proof of persistence for a long period of effective, if minute, dose of available chlorine irrespective of the relative amounts of organic matter and disinfectant which may be brought into contact in a water sample. As he states it "the quantity of chlorine which is fixed by a water is not, as one might suppose, determined by the quantity of organic matter present."

This statement runs directly counter to the presumption on which absorption tests are based. It would be assumed from the latter that the majority of waters, by reason of their organic content, would account for more than the amount of chlorine available in the Bunau-Varilla process, but the Rheims experiments indicate otherwise. They suggest instead, that the organic gourmand may always be relied upon to leave a few crumbs for the more reticent guests. The details of a series of experiments will illustrate this.

A litre of Marne water (organically impure) was placed in each of three flasks and to these were added sodium hypochlorite giving 0·5, 3·0 and 6·0 milligrammes of free chlorine respectively. Half an hour's contact was allowed and the contents of the flasks were then tested for the quantity of chlorine which had been fixed by the litre of water in each. In the first flask to which 0·5 milligramme had been added the proportion of chlorine fixed, to the original dose, was 86 per cent., in the second flask 47·3 per cent., and in the third flask 29 per cent.

A second series of experiments showed that if the organic gourmand was fed in three successive stages, at half-hourly intervals, with sodium hypochlorite providing respectively 1/2, 3 and 3 milligrammes of available chlorine, the proportions fixed were 86, 50, and 49·6 per cent.

Dr. Téchoueyres's observations on these experiments are, first, that the proportion of chlorine which is fixed varies with the quantity offered, and, secondly, that successive additions cause a greater absorption than a single meal, and both prove that the results cannot be explained on the basis of chemical interaction.

A second fact which the Rheims workers claim to have established is the difference in vulnerability to *eau de Javelle* of organisms of the typhoid group and the colon bacilli—the latter, in their experiments, proving the more resistent. It is to be noted that other investigators have not been able to come to so definite an opinion on this point, but the desirability of such an assurance is apparent in view of the margin of safety which it affords where the colon bacillus standard of purity is adopted.

The third fact which the Rheims observations have emphasised is the effect which agitation and prolonged contact have upon the degree of purity attained. In this connexion details are given which indicate that even the feeble doses employed are actually or potentially available for more than 24 hours, and that during this period their destructive action continues. This is corroborated by other observers, and as regards contact by the interesting judgment which has been quoted in the Boonton case. As regards "brassage" or agitation, Dr. Téchoueyres considers this as of equal value, at least, with duration of contact.

The Bactericidal Ray Hypothesis.

Whilst it is not essential to a description of the water purification system devised by Mr. Bunau-Varilla, this note on certain features of the work which has been incidental to its evolution would be incomplete without a brief reference to the interesting hypothesis which has been adopted by the authors in explanation of the action of doses of chlorine which are so chemically inadequate and yet so practically effective. To emphasise this inadequacy Dr. Téchoueyres postulates the current theory of the action of sodium hypochlorite in the purification of water, represented by the formula :—

$$NaOCl + H_2O = HCl + NaOH + O$$

or, in the presence of a catalyser,

$$NaOCl = NaCl + O$$

—i.e., an atom of oxygen, with the atomic weight of 16, is liberated by an atom of chlorine with the atomic weight of 35·5. Noting that the Rheims water contains organic matter equivalent to about 1 milligramme of oxygen, he remarks that obviously twice this amount of chlorine should be required to replace this alone, whereas in actual practice the addition of a twentieth of the quantity proves to be an effective bactericide. From so irreconcilable a supposition the authors fall back on the hypothesis formulated by Mr. Jean Perrin (published under the title "Matière et Lumière" in the *Annales de Physique* in 1919) that all chemical reactions and, generally speaking, all changes in the physical state of bodies give rise to the emission or reception of particular rays. Arguing on this assumption Mr. Bunau-Varilla and Dr. Téchoueyres suggest that the rupture of the molecule of sodium hypochlorite, when added to water, produces an emission of rays analogous to ultra-violet rays much in the same manner that luminous rays are incidental to ordinary combustion, and that such special rays are the true lethal agent. They state that they have obtained a certain amount of confirmation of this hypothesis.

This brief account of a prolonged investigation which cannot be without interest to all engaged in water purification will show that there are debatable features—bacteriological standards, technique, general conditions—all are variable, and even the reagent employed is not the same as used in this country, but when all these have been discounted two incontestible facts remain: first, that the Bunau-Varilla system is adequate, in practice, to the production of a safe public water-supply; and, secondly, that it is superior in point of economy, simplicity, and absence of objectionable results to many processes now in use.

My acknowledgments are due to Profs. Besredka and Calmette, of the Pasteur Institute, from whom my earliest information of the Bunau-Varilla system was obtained, and to Dr. Téchoueyres for his courtesy in demonstrating and explaining it and the details of the work which has been done in connexion with it.

References.

1. Sterilisation des Eaux Potables par Auto-Javellisation (Système Bunau-Varilla). Obtainable from the Bureau municipal d'hygiène, Reims.
2. Historique et Description de Auto-Javellisation (Système Bunau-Varilla). Obtainable as above.
3. Chlorination of Water, by Joseph Race, F.I.C. London: Chapman and Hall. (This excellent work has been frequently quoted from in the foregoing paper.)
4. Twenty-third Annual Report of the Metropolitan Water Board.

A DESK MANUAL.

Mr. J. B. Thornhill has reproduced the Hippocratic Oath [1] in incised white letters on blackwood panel, to be placed on the doctor's desk. The panel is 9¼ inches by 7¼ inches—i.e., it is roughly double the size of an ordinary sheet of writing paper—and the width of the lettering is 5¼ inches, giving an inch margin between the bevelling and the lettering, which is executed in five well-balanced paragraphs dealing with the doctor's relations to his patients. Mr. Thornhill has ignored the duties of the doctor to his brother doctors, his rendering being as follows :—

THE DOCTOR'S OATH.

I will follow the system of regimen which, according to my ability and judgement, I consider for the benefit of my patients and abstain from all that is mischievous and deleterious.

I will give no deadly medicine if asked, nor will I suggest such plan; so too, I will not procure abortion.

With Purity and Holiness I will pass my life and practise my Art.

Into whatever houses I enter I will go into them for the benefit of the sick and abstain from all voluntary actions of mischief and corruption.

Whatever in professional practice or outside it in the life of the world I see or hear, which ought not to be spoken abroad, I will not divulge, for such things should be kept secret.

The idea of the panel is to show the layman the earnestness and discretion of the medical profession, whose ideals few members of the general public realise.

ELECTROTHERAPY AFTER PROSTATECTOMY.

To the Editor of THE LANCET.

SIR,—A man of 65 had his enlarged prostate removed by the suprapubic route as it was producing retention overflow. He was also in a state of low resistance owing to a combined degeneration of his spinal cord. Fourteen days after the operation the wound was unhealthy and septic, and showed no signs of closure. He was given daily local massive doses of tungsten arc ultra-violet light to the wound for five days, and general irradiation to different parts of his body in ordinary doses. High frequency with the vacuum electrode was also applied to the wound itself. Within four days the whole area had become clean, and within 14 days the wound had closed up.

I am, Sir, yours faithfully,

Sheringham, Norfolk, Feb. 9th, 1929. H. W. HALES.

Messrs. Armour and Company, manufacturers of Glanoid medicinal products of animal origin, have removed their pharmaceutical department from Kingsway to Armour House, St. Martin's le Grand, London, E.C. 1.

[1] The Doctor's Oath. 176 Blackwood Panels, 12*s.* 6*d.* each. Stand, 1*s.* 6*d.* J. B. Thornhill, Geldeston, Beccles, Suffolk.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 18th.—5.30 P.M., GENERAL MEETING OF FELLOWS: Ballot for election to the Fellowship. 8 P.M., PATHOLOGY. Communications: J. D. W. Bland: Filter and Centrifuge Experiments with Neuro-vaccine. H. D. Wright: The Susceptibility of the Pneumococcus to Inhibiting Influences. R. M. Fry: The Leucocyte Count in Defibrinated Blood. Demonstrations: J. M. Ross: Ayerza Syndrome with Pulmonary Syphilis. G. Hadfield: Landau's Disease.

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.). Dr. J. E. M. Wigley: 1. Scleroderma. 2. Urticaria Pigmentosa in an Adult. 3. Pityriasis Rubra Pilaris. Other cases will be shown.

FRIDAY.—5 P.M. DISEASE IN CHILDREN. (Cases at 4.30 P.M.). Short paper. Dr. Gerald Slot: A Clinical Method of Estimating Cardiac Efficiency in Children, and the Work of a Rheumatism Supervisory Centre. 8 P.M., EPIDEMIOLOGY. Paper: Surgeon-Commander Sheldon F. Dudley: Human Adaptation to a Parasitic Environment.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Feb. 18th.—9 P.M., Dr. H. W. Wordsworth Barber: Dermatology in Relation to Other Branches of Medicine. (First Lettsomian Lecture.)

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W.

THURSDAY, Feb. 21st.—8.15 P.M. (preceded at 7.45 P.M. by a demonstration illustrating the subject of the paper), Dr. L. W. Hackett: Malaria Control Through Anti-Mosquito Measures in Italy.

CHELSEA CLINICAL SOCIETY.

TUESDAY, Feb. 19th.—8.30 P.M. (at the Hotel Rembrandt, Thurloe-place, S.W.), Dr. Eckenstein: Folklore. Opened by Dr. Dan McKenzie.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

MONDAY, Feb. 18th.—8 P.M., Sir Thomas M. Legge: Thirty Years' Experience of Industrial Maladies. (First Shaw Lecture.)

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

FRIDAY, Feb. 22nd.—8.30 P.M., General Meeting. Dr. H. C. Semon: The Diagnosis and Treatment of Non-Syphilitic Lesions of the Male and Female Genitalia. A discussion will follow which will be opened by Dr. H. M. Hanschell.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, Feb. 18th to SATURDAY, Feb. 23rd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., 5 P.M., Lecture, Dr. A. C. Roxburgh: Pitfalls in Dermatology.—NATIONAL HEART HOSPITAL, Westmorcland-street, W. Tues., 10.30 A.M., Clinical Demonstration, Dr. B. T. Parsons-Smith.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., 4 P.M., Demonstration, Dr. C. M. Wenyon: The Part played by Animals in the Spread of Disease.—CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C. Thurs., 2 P.M., Clinical Demonstration, Mr. Gill-Carey.—The above are free.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Post-graduate course in Gynæcology. Mornings and/or afternoons. Second week.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Special post-gra duate course in Dermatology. Every afternoon, clnical work. Lectures twice weekly. Further particulars from the Secretary.

UNIVERSITY COLLEGE, London.

TUESDAY, Feb. 19th.—5.30 P.M., Miss E. M. Elderton: Growth Curves in Women from Childhood to old Age.

FRIDAY, Feb. 22nd.—5.30 P.M., Dr. J. Howard-Jones: The Hygiene of the Mercantile Marine. (First lecture: Chairman, Dr. Charter Porter.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Feb. 21st.—4 P.M., Dr. Wyllie: Infection of the Genito-Urinary Tract.

NATIONAL COUNCIL FOR MENTAL HYGIENE.

WEDNESDAY, Feb. 20.—5 P.M. (at the Medical Society of London, Chandos-street, W.), Dr. Letitia Fairfield: Efficiency and Deficiency.

(*Continued at foot of next column.*)

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 320.*)

THE following official bulletins have been issued:—

THURSDAY, FEB. 7TH. 11.45 A.M.

Though the stage of convalescence has not yet arrived, His Majesty's progress is such that the proposed change to the south coast is now desirable. (Signed by Sir Stanley Hewett, Sir Hugh Rigby, Sir Farquhar Buzzard, Sir Humphry Rolleston, and Lord Dawson of Penn.)

FRIDAY, FEB. 8TH. 12.15 P.M.

The progress of His Majesty the King, though slow, continues. A radiogram taken this morning confirms the clinical evidence that the condition of the lungs is now normal. If the weather permits, His Majesty will leave the Palace at 10.30 to-morrow morning for Craigweil House. (Signed by Sir Stanley Hewett, Dr. H. Graham Hodgson, and Lord Dawson of Penn.)

SATURDAY, FEB. 9TH. 6 P.M.

His Majesty the King travelled to Craigweil House without undue fatigue, and the general condition is satisfactory. (Signed by Sir Stanley Hewett and Lord Dawson of Penn.)

SUNDAY, FEB. 10TH. 4 P.M.

His Majesty the King had a good night, and his improvement continues. (Signed by Sir Stanley Hewett and Lord Dawson of Penn.)

(*Continued from previous column.*)

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Feb. 18th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N. (Intensive Week.)

MONDAY, Feb. 18th.—2.15 P.M., Mr. Kenneth M. Walker: Chronic Infection of the Urinary Tract. 3.15 P.M., Dr. W. J. Adie: Some Sudden Attacks of Nervous Origin.
TUESDAY.—2.15 P.M., Mr. F. D. Saner: The Repair of Fractures. 3.15 P.M., Dr. E. G. B. Calvert: Points of Practical Importance in Glycosuria and Albuminuria.
WEDNESDAY.—2.15 P.M., Mr. N. A. Jory: Chronic Nasal Obstruction. 3.15 P.M., Dr. H. C. Semon: Demonstration of Selected Cases.
THURSDAY.—2.15 P.M., Dr. W. H. McKinstry: Pathological Specimens. 3.15 P.M., Mr. C. S. Lane-Roberts: Some Disorders at the Menopause.
FRIDAY.—2.15 P.M., Dr. Bruce Williamson: Demonstration of Selected Medical Cases. 3.15 P.M., Mr. T. T. Higgins: Some Points in the Ætiology and Diagnosis of Gall-stones.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Feb. 18th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Collier: Cerebral Vascular Disease.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Donald Armour: Surgery of Compression Paraplegia.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: The Demonstration of Cerebellar Lesions.
FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of the Nervous System. 2 P.M., Dr. Adie Out-patient Clinic. 3.30 P.M., Dr. Walshe: Multiple Neuritis.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, Feb. 22nd.—3.30 P.M., Mr. Hay: Spectacles Ancient and Modern.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE Manchester.

FRIDAY, Feb. 22nd.—4.30 P.M. (at the Whitworth-street West Branch), Mr. Morley: The Treatment of Birth Injuries.

Hunterian Lecture

ON THE TREATMENT OF SOME ACUTE ABDOMINAL DISORDERS.

Delivered before the Royal College of Surgeons of England on Feb. 4th

BY R. J. MCNEILL LOVE, M.S. LOND.,

ELLOW OF THE COLLEGE; LATE SURGICAL REGISTRAR AND ASSISTANT AT THE LONDON HOSPITAL; ASSISTANT SURGEON TO THE METROPOLITAN HOSPITAL.

I.—ACUTE APPENDICITIS.

I OFFER no apology for introducing such an pparently threadbare subject as acute appendicitis, r, according to the Registrar-General's returns, early 3000 deaths occur every year in this country om this condition. When one remembers that this ll is taken chiefly from those in the second and third cades, then this mortality is even more perturbing. In spite of improving diagnosis and earlier opera- on, the annual mortality remains at a little over per million. Probably, as Rendle Short has cently emphasised, one of the influences which unteracts improved surgical measures is the diminish- g amount of cellulose consumed in civilised diets. one period of the war I was medically responsible r the health of an Arab town and district with a pulation of about 15,000. The staple diet of the ople consisted of dates, unpolished rice, and barley ead, and during my stay of six months I saw no se of appendicitis. Under corresponding circum- ances in a civilised community one would have pected about half a dozen cases.

When I returned from the war to take up the ties of surgical registrar at the London Hospital e following state of affairs intruded itself upon my tice—that in some wards every case of acute pendicitis was treated by an emergency operation, ilst in other wards cases in which mischief had pparently spread beyond the appendix were treated pectantly. Such discrepancy demanded investiga- on, and consequently I reviewed all the cases treated the London Hospital from 1920 to 1924, totalling 18.[1] Ignoring the early cases in which the infection still limited to the appendix and which are univer- lly treated as a surgical emergency, an analysis the remainder indicated that cases treated with scrimination, and not according to rule of thumb, owed a lower immediate mortality and a much less rmidable proportion of complications and sequelæ an the cases operated upon as soon as seen.

TABLE I.

	LONDON	ST THOMAS	MANCHESTER	TOTAL
	— EXPECTANT —			
CASES.	341	214	52	607
DIED.	12	9	3	24
MORTALITY.	3·5%	4·2%	5·7%	3·8%
	— IMMEDIATE —			
CASES	1667	901	128	2706
DIED.	98	76	6	180
MORTALITY.	5·8%	8·4%	4·6%	6·7%

Partly, I believe, as a result of these statistics and nclusions concerning this subject, interest and scussion were rearoused, and 1115 cases at St. homas's Hospital were reviewed and published.[2] ice then intermittent correspondence has appeared in medical journals, and only last year a review appeared of 245 cases treated at the Manchester Royal Infirmary.[3] It has been said that there are three kinds of lies—the ordinary lies, black lies, and statistics. However, when statistics assume massive proportions and are compiled from different sources, then discrepancies due to chance and coincidence correspondingly diminish. I have accordingly combined the figures from the London Hospital, St. Thomas's Hospital, and the Manchester Royal Infirmary. The figures given in Table I. do not include early cases in which the disease was limited to the appendix, and the summary from the three hospitals shows that 607 cases were treated on expectant lines with a mortality of 3·9 per cent., and in 2706 cases in which immediate operation was performed the mortality was 6·7 per cent.

Treatment of General Peritonitis.

Cases of acute appendicitis may be divided clinically into three groups—the early cases, those in which the general peritoneal cavity is involved, and intermediate cases in which the infection has spread beyond the appendix but is limited to the right iliac fossa. We need not consider the early cases which are properly dealt with as emergencies. I shall only briefly refer to the second group—that is, those of general peritonitis. In these cases a comparatively high mortality is to be expected, owing partly to the virulence of infection as compared with the patient's resistance, which is indicated pathologically by the inability of the tissues to form protective adhesions.

In cases of general peritonitis, appendicectomy certainly appears to be the rational treatment rather than temporising with a perforated or gangrenous appendix which provides a constant stream of infection. However, there are two points which merit brief reference.

1. If operation is performed the appendix should always be removed if reasonably possible, but with a minimum of exposure and manipulation. Any unnecessary manipulation increases lymphatic and venous absorption of toxins. The old-fashioned procedure of evisceration and scrupulous peritoneal cleansing produced acute toxæmia which was emphasised by the term "post-operative shock," but in reality was a massive and lethal dose of toxæmia.

2. If the general condition of the patient is precarious so that the operative risk is obviously high, then expectant treatment should be given a trial, and it is surprising how some hopeless cases respond and either resolve or else form a localised abscess. In profoundly toxic cases the administration of glucose in rectal saline is a valuable adjunct to treatment, and if an anæsthetic is administered chloroform should be regarded as a poison owing to its deleterious effect on the liver cells, which are already seriously impaired by toxæmia. I have collected 12 cases in which jejunostomy was performed almost as a last resort in cases of peritonitic ileus. There were nine deaths and three recoveries. This may not seem very encouraging, but it must be remembered that the three recoveries were three pleasant surprises. These patients are desiccated by vomiting and may be unable to retain fluid in the form of enemata; jejunostomy is therefore valuable in that it allows administration of adequate quantities of saline and glucose, with consequent dilution of toxins in the body fluids. Antigangrene serum appears to be of some value in these cases, but choline is disappointing.

3. The third group demands critical consideration, and comprises those cases in which inflammation is limited to the right iliac fossa, and which present themselves from the second day of the disease onwards as a localised peritonitis or a circumscribed abscess. In both cases three quadrants of the abdomen are relatively free from tenderness or rigidity, and if localised peritonitis is present rigidity is marked in the lower right quadrant, and an indefinite and tender mass may be palpated. If suppuration ensues the rigidity becomes less marked and the swelling more

defined. When localised peritonitis is present appendicectomy may be extremely difficult, and I have on more than one occasion witnessed an attempt at appendicectomy abandoned after prolonged searching and considerable trauma to tissues. The congestion and turgidity of the bowel and omentum, the friability of the tissues, and the presence of adhesions are all stumbling-blocks to a well-executed operation. Moreover, however gentle interference may be, or however carefully packing is inserted, the early protective adhesions are easily separated, and general peritonitis may result when originally only a local infection was present. During my military service I twice assisted a surgeon in India to literally tear out two appendices which were firmly matted and behind a turgid cæcum. Both cases ended fatally, and in the light of subsequent observation I believe that these cases would have subsided, or rather were actually subsiding, at the time of operation. If a localised abscess is present, attempts at appendicectomy, as far as the local condition is concerned, may be even more dangerous. Besides the risk of contamination by pus there is the difficulty of knowing when to cease searching for, or endeavouring to separate, an unwilling appendix, and this problem may tax the judgment of the most experienced.

Technique of Delayed Treatment.

It will perhaps be expedient to epitomise the routine adopted when delayed treatment is employed. If infection has spread beyond the confines of the appendix, the patient is placed in Fowler's position, fomentations are applied locally to relieve pain, and only water is allowed by the mouth until the patient expresses a desire for nourishment, which usually coincides with the fall of temperature. A four-hourly chart is kept, so that temporary variations of pulse and temperature are recorded. No aperient is given, if flatulence or distension cause discomfort, then a small soap and water or glycerine enema is administered. Sudden distension of the rectum by a large enema should be avoided, as an abscess has been ruptured by this means. If the signs and symptoms abate, then the patient should be kept in bed for a week after the temperature and pulse have been normal, or until the lump has disappeared. In the minority of cases the surgeon's hand may be forced and intervention may be necessary in delayed cases for the following reasons :—

1. Persistence of rapidity of pulse or elevation of temperature, particularly when considered in conjunction with local signs.
2. The formation of an abscess which increases in size, owing to the risk of rupture into the general peritoneal cavity. Gas and oxygen anæsthesia is usually sufficient for these cases.
3. Slow absorption of an abscess, in which case degeneration of viscera may occur.

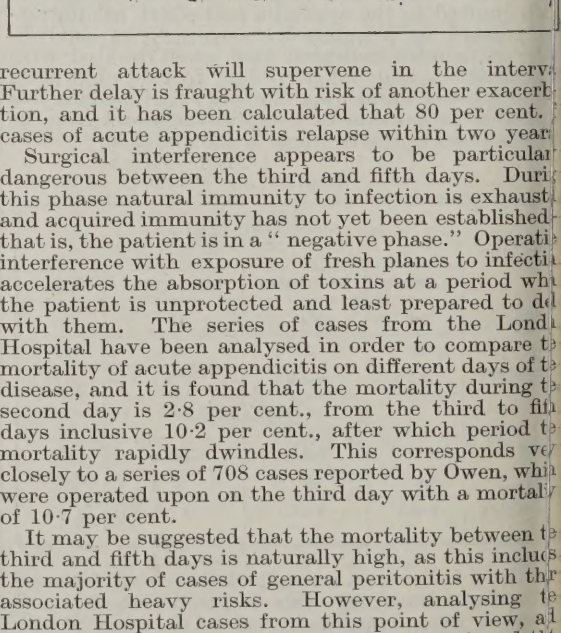
A case has been referred to in one paper on this subject in which delayed treatment was successfully adopted in a healthy man, but after subsequent appendicectomy fatal heart failure supervened. At post-mortem examination the heart muscle was found to be degenerated and fatty, and this was presumed to be due to toxæmia following the absorption of the abscess.

It must be clearly and emphatically stated that delayed treatment can only be adopted when the patient is under continuous supervision and complete control—that is, usually in a hospital or nursing home—and the routine treatment already indicated must be adhered to rigidly. Delayed treatment is generally unsuitable in patients whose resistance is at a low ebb—e.g., at the two extremes of life, or following severe illness or pregnancy. Acute appendicitis carries a mortality of about 13 per cent. in children during the first decade, and these cases are unlikely to subside, partly as a result of the energetic exhibition of purgatives. As Adams dramatically states[4]: "The mother may be an unconscious murderer of her own child, and a dose of castor oil may be as poisonous as a dose of hemlock." Recently an account appeared in THE LANCET of 50 cases analysed from Addenbrooke's Hospital [5] in order to gauge the effect of castor o when administered to children with acute appendicitis and it was found that the appendices in eight cases i which oil had been given were all gangrenous, whereas in 42 cases which had been spared the oil only two were gangrenous. It should be realised that gangren is not entirely due to the stimulating and irritatin effect of the purgative, but also to delay whil awaiting the result of the administration. Further more, the age and intelligence of children naturall handicap them in expressing their symptoms, an thus symptoms may be missed in the early stages c errors may be made in diagnosis.

The Time for Surgical Intervention.

If delayed treatment is successful then the questio arises as to the best time for appendicectomy. It surprising how long is needed for the last dregs pus to be absorbed, and, although pus is relativel innocuous after resistance has been established, appears wise to wait until all traces of acute infectio have subsided. Probably the best plan to adopt is f the patient to leave hospital and return three montl after for a clean appendicectomy. This affords amp time for visceral regeneration, presuming son degeneration had occurred, and it is unlikely that

FIG. 1.



recurrent attack will supervene in the interv Further delay is fraught with risk of another exacerb tion, and it has been calculated that 80 per cent. cases of acute appendicitis relapse within two year

Surgical interference appears to be particula dangerous between the third and fifth days. Duri this phase natural immunity to infection is exhaust and acquired immunity has not yet been established that is, the patient is in a "negative phase." Operati interference with exposure of fresh planes to infecti accelerates the absorption of toxins at a period wh the patient is unprotected and least prepared to d with them. The series of cases from the Lond Hospital have been analysed in order to compare t mortality of acute appendicitis on different days of t disease, and it is found that the mortality during t second day is 2·8 per cent., from the third to fi days inclusive 10·2 per cent., after which period t mortality rapidly dwindles. This corresponds ve closely to a series of 708 cases reported by Owen, wh were operated upon on the third day with a mortal of 10·7 per cent.

It may be suggested that the mortality between t third and fifth days is naturally high, as this inclu the majority of cases of general peritonitis with th associated heavy risks. However, analysing t London Hospital cases from this point of view, a excluding cases of general peritonitis, it is found t 401 cases were operated upon between third and fi

ys with either local peritonitis or local abscess, and ended fatally—that is, the operative risk, when ection was localised to the right iliac fossa, was per cent.

In an endeavour to find some pathological support the high mortality during this dangerous period, have compiled a series of leucocyte counts on ferent days of the disease. The accompanying art (Fig. 1) indicates the average total number of icocytes present in the blood in a series of 29 patients, of whom presented an inflammatory mass in the ht iliac fossa, and who responded to delayed atment.

From this it will be seen that there is no marked e in the total number of leucocytes until after the h day. An even more significant fact is that there no marked increased proportion of polymorpho-clear cells until after the sixth day. This is mittedly a small series of cases, but presuming that eucocytosis bears some relation to the resistance to ection, then the chart supports the contention that e third to the fifth days may be regarded as the ngerous period.

Criticisms of Delayed Treatment.

It may now be advisable to consider some of the ticisms levelled against delayed treatment. Four in objections have been advanced which may be mmarised as follows: the refusal of the patient to ow subsequent appendicectomy; the influence on blic opinion; expediency; and surgical reputation. In considering these objections in further detail, erence has already been made to the necessity of moving the appendix about three months after lammation has subsided. In some cases it may be ficult to persuade an obstinate patient to return operation, or he may delude himself in the hope at he will be fortunate enough to escape recurrence. is difficulty is overcome if the proper relationship ists between patient and surgeon—that is, one of plicit confidence. The main planks of the surgeon's gument are not only the risk of recurrent appendi-is, but the possibility of subsequent associated ease of other organs, and that interval appendicec-my has a negligible mortality and a limited and own period is required for convalescence.

It has been stated that "If the public recognise at immediate operation yields the best results in pendicitis, the doctor's duty will be simplified. If change this point of view the public will get the ea that appendicitis should be treated on medical d not on surgical lines." This objection suggests at the diagnosis of appendicitis is made by the blic, but even if such a state of affairs existed the ctor would probably be consulted in order to nfirm or disprove the diagnosis. Now the doctor's ty is clearly defined. Any case of acute appendicitis whatever stage is in urgent need of surgical treat-nt, either by operation or supervision, and public inion will reflect this standpoint whichever line of atment is subsequently adopted. It appears an olerable position that surgeons should allow public norance or prejudice to influence them in pursuing y line of treatment.

Delayed treatment certainly imposes a considerable x upon the time and skill of the surgeon, as frequent sits and examinations are necessary in order to note ogression or retrogression of infection. Further-ore, considerable judgment is necessary in order to cide when interference should be adopted if such necessary. However, it will be agreed that time and ouble are of no consequence if repaid by diminished ortality lists. If, of course, for geographical or her reasons the surgeon cannot maintain constant ntact with the patient, then, unless a firm small ass is present, appendicectomy is probably a wise urse. On the other hand, delayed treatment may the safest line to adopt in *any* stage of appendicitis, en at the onset, if surgical conveniences and ameni-s are not available.

Recently an appendix was removed on a small passenger at in the South Atlantic. The operation was performed during rough weather by an unassisted and recently qualified ship's doctor, using spoons as retractors, with the purser acting in the rôle of anæsthetist. The passenger survived and was carried ashore at Plymouth with a suppurating wound, and the ship's doctor received grateful thanks from the patient and congratulations from the ship's company. In reality, the risk to which the patient was exposed by operation under prevailing conditions must have been very considerably greater than if he had been starved in Fowler's position.

When inflammation has spread beyond the appendix, whatever treatment is adopted, a small but definite mortality must be expected. If a case treated on delayed lines ends fatally, it is usually regarded as a tragedy, and all concerned may have lingering doubts in their minds as to whether immediate operation would not have saved the patient. On the other hand, if the appendix is immediately removed and the patient succumbs, the general impression is that, because active treatment was adopted, everything possible was done and the fatality is accepted philosophically. The point I wish to stress is that a masterly inactivity demands a high standard of courage on the part of the surgeon and the implicit confidence of the patient.

If delayed treatment is successful, not only is the actual mortality of acute appendicitis diminished, but post-operative complications are reduced to about one-third of the number which follow immediate operation. Immediate complications—e.g., fæcal fistula and secondary abscesses—are favoured by the necessity for drainage and separation of adhesions, whilst sequelæ, such as adhesions and incisional herniæ, are to be expected after drainage of the peritoneal cavity and infection of the parietes.

I would here make a suggestion regarding the method of drainage when such is necessary in acute cases. If a gridiron incision has been made and pelvic drainage is needed, this should always be obtained by a separate suprapubic incision. In analysing the series of cases from the London Hospital complications, fatal and incidental, were more than twice as common when the pelvis was drained through the gridiron incision than by more direct suprapubic drainage. This is accounted for by the shorter and more dependent suprapubic route, and the absence of pressure by the tube on the inflamed cæcum which predisposes to fæcal fistula.

I note with considerable relief that most recent papers on this subject now at least consider the merits of delayed treatment, and I heartily endorse the conclusions of Rayner based on observations at the Manchester Royal Infirmary,[3] which I quote herewith, as they approximate to my own views. He states: "I think we may, from our clinical experience and observation at operation, recognise certain types in which it is safer, and in other ways better for the patient, that immediate operation should not be undertaken, such for example are the following:—

1. The patient who presents a firm, hard mass in the right iliac fossa, right loin, or over the forepart of the iliac crest; the mass is ill-defined at its edges, often extensive, and free from marked tenderness. Such a case will commonly subside entirely, or the mass slowly resolve into a well shut-off abscess, which can be easily and safely opened. Immediate operation is difficult and unsatisfactory, and convalescence prolonged and troublesome.

2. The patient who presents an area of well-localised muscular rigidity without extreme tenderness over the appendicular site. His temperature is raised and the pulse moderately accelerated. Such a patient is by no means best dealt with by immediate operation, and the following circumstances should be regarded as indicating a temporising policy: (*a*) retrocæcal position; (*b*) general condition unfavourable by reason of stoutness, bronchitis, emphysema, alcoholic tendency; (*c*) history of preceding attacks which have subsided; (*d*) unfavourable environment.

Subsequently he adds: "I believe it is possible to exercise discrimination in some cases without adding to the risk of others."

Sherren,[6] after over 20 years' experience at the London Hospital, states: "The only change I have

made has been to greater conservatism and more patience in dealing with cases of appendix abscess."

Conclusions.

These statistics, observations, and opinions all constitute a very earnest plea for discrimination in dealing with cases where infection has begun to localise, and has already localised in the right iliac fossa. The 9 per cent. mortality, which is the price paid for immediate interference in these localised or localising cases during the third and fifth days, is tragically high when one considers that nature has successfully erected a barrier to infection and that immunity is increasing daily.

When the pathology of acute appendicitis was first appreciated the pendulum of treatment swung from purely medical, under the care of a physician, to immediate operation by the surgeon, and normal beneficent reaction of tissues to inflammation was regarded with suspicion. In discriminating hands the pendulum in coming to rest in an intermediate position, and I anticipate the day when the rule-of-thumb surgeon, who operates on every case as soon as he sees it, will be as out of date as the physician who, in years gone by, treated perityphilitis by purgatives and enemata.

II.—Acute Cholecystitis.

The problems concerning the treatment of acute cholecystitis resemble to some extent those which have been discussed in connexion with acute appendicitis, and it is apparent that surgeons still differ as to whether cases of acute cholecystitis should be submitted to immediate operation, or whether opportunity should be given for remission. On the one hand, a well-known surgeon states that "Cholecystectomy during the acute stage is an unwarrantable danger," and on the other hand a surgeon of international repute recommends immediate operation, cholecystectomy being the objective.

In reviewing Continental and American literature one finds that the treatment tends towards expectancy—that is, of allowing acute inflammation the opportunity to subside with subsequent operation after remission of symptoms. Hotz, in a paper presented to the German Surgical Association in 1923, produced figures which indicated that the mortality of operation during an acute attack was double of that which followed operation after remission. Following a discussion at the Surgical Society at Lyons in 1923 the French schools were doubtful of the wisdom of immediate operation and were of the opinion that if operation was indicated during an acute attack of cholecystitis, then drainage of the gall-bladder was preferable to removal, and in 1926 these views were confirmed by Pauchet. Last year Bruggeman [7] read a paper before the Western Surgical Association of the United States and produced statistics supporting expectant treatment.

In comparing the pathology of acute cholecystitis with that of acute appendicitis, it is found that generalised infection of the peritoneum is a much less common complication in cases of inflammation of the gall-bladder. The gall-bladder is rapidly shut off by adhesions between the liver, transverse colon, mesocolon, and omentum, so that perforation of the gall-bladder into the general peritoneal cavity is an uncommon event. In acute cases it is easy to imagine at operation that the gall-bladder is on the point of bursting, and that the operation has fortunately just averted this calamity. Turgidity may be confused with distension, and in acute cases the wall of the œdematous gall-bladder may measure half an inch or more in thickness. Popular opinion pictures the gall-bladder bursting like an overblown balloon, but perforation is probably in all cases due to local gangrene of the wall of the gall-bladder.

I have reviewed 107 cases of acute cholecystitis, the majority of whom were admitted to the London Hospital during the period 1922–26, and have divided them into those treated expectantly and those operated upon immediately (Table II). On examining these figures we find a mortality of 20 per cent associated with immediate operation. This is due in some measure to similar causes to those mentioned in connexion with acute appendicitis—that is, transitory lack of resistance of the patient and increased infec

Table II.

—IMMEDIATE—				
Nº OF CASES	C.B DRAINED	C.B REMOVED	DIED	MORTALITY
38	16	22	8	.21%
—EXPECTANT—				
INTERVENTION NECESSARY				
9	6	3	3	33%
SUBSIDED				
43	5	38	4	9%
TOTAL				
52	11	41	7	13%
17 CASES SUBSIDED – NO OPERATION				

tivity of gall-bladder contents during the exacerbatio and the greater difficulty of an operation conducte on acutely inflamed viscera.

As compared with acute appendicitis, however, a additional factor manifests itself in the shape of lu complications. Out of eight cases which died followi immediate operation, no less than three deaths we attributed to pneumonia. The association of acu cholecystitis and pneumonia has been emphasised b Wilkie,[8] and no doubt the anæsthetic and limitatio of movement of the diaphragm following operati trauma precipitates pneumonia in these cases.

If cases are treated expectantly the routine adopte is similar to that already described for acute append citis, with the addition that a dose of morphia advisable when it has been definitely decided postpone immediate operation. The mortality of a cases treated expectantly was 13 per cent., and inte vention was necessary in nine cases out of 52 whi were treated on expectant lines. In two of these cas general peritonitis was present following gangrene the gall-bladder. In four of the remainder a localis abscess formed around the gall-bladder; in one ca stones were found in the pus, indicating perforatio The remaining three cases did not subside, althou infection was still limited to the gall-bladder. Cho cystectomy was performed in the majority of cas which subsided, obesity and shrunken adherent ga bladders preventing removal in only five out of 43 cas Four deaths occurred, two of them being due pulmonary embolism, both on the sixth day aft operation. One of these cases was operated up when the temperature had barely settled and t pathologist reported that the gall-bladder show "acute hæmorrhagic and focal necrosis." This sugge that operation was somewhat premature and that t return of temperature to normal does not coincide wi subsidence of inflammation. Probably a suitable ti for operation would be one week after the disappe ance of all signs and symptoms. Of the other t deaths which occurred in cases which had subsid one was due to subphrenic abscess and the oth apparently to lung complications.

Not only is the mortality lower in cases treat expectantly, but in a much greater proportion patients the satisfactory operation of cholecyst tomy may be performed rather than mere cho cystostomy. Of 38 cases operated upon immediat the gall-bladder was removed in 22—that 58 per cent.—whereas of 52 cases treated exp tantly, cholecystectomy was performed in 41, 79 per cent.

There are two main objections to be levelled at delayed treatment:—

1. The patient may refuse subsequent operation. In this series, out of 69 cases which successfully subsided, in 17 no subsequent operation was performed. Some of these cases were unsuitable for surgical treatment, most commonly on the grounds of obesity, and so no operation was urged, but in at least five cases operation was definitely refused. It appears to be a human characteristic that as the sands of time run low, to regard them as increasingly precious, and the older the patient the less willing are they to submit to what they consider "the risk of an operation."

2. The second objection is the greater possibility of an erroneous diagnosis as compared with acute appendicitis. Perforated ulcers, intestinal obstruction, acute pancreatitis, and inflammation of a high appendix may all be mistaken for acute cholecystitis. Right basal pneumonia with reflex rigidity of the upper part of the right rectus is another possible error, and, as already mentioned, the two conditions may be associated.

These two objections to expectant treatment are countered by laying facts plainly before the patient and explaining that interval operation is the lesser of the two risks, and the risk of erroneous diagnosis is reduced by careful clinical examination. Of course, if a reasonable element of doubt exists regarding diagnosis, then the expectant treatment is not recommended; also in this condition, as with appendicitis, expectant treatment can only satisfactorily be adopted when the patient is under supervision and control.

A dissertation on the differential diagnosis of acute cholecystitis would be wearisome, but there is one physicial sign which is frequently present and very reassuring when elicited. This sign, associated with the name of Boas, consists of hyperæsthesia of the seventh, eighth, and ninth thoracic segments. It is best detected below the angle of the right scapula, and depends upon distension of the gall-bladder with consequent stretching of the visceral peritoneum. In cases of a distended high appendix hyperæsthesia will be located in the usual appendicular triangle—that is, an area the apex of which is at the umbilicus and the base along the outer half of Poupart's ligament—and the location of hyperæsthesia may be a valuable and convincing sign in distinguishing acute inflammation of the gall-bladder and appendix.

From these statistics one is enabled to draw the following conclusions: 1. Operation during an acute attack of cholecystitis carries a high mortality. In this series of cases 21 per cent. 2. Most cases treated expectantly will subside. In this series out of 69 cases treated expectantly, in only nine cases was intervention necessary. 3. If expectant treatment is successful, then in a much larger proportion of cases the complete and desirable operation of cholecystectomy is possible.

Hence the review of these cases support the contention that expectant treatment carries a lower mortality and allows of safer and more efficient surgical treatment, as compared with immediate operation.

III.—Acute Pancreatitis.

The incidence of acute pancreatitis is about one case in every 5000 surgical emergencies.[9] It is a prevalent opinion that acute pancreatitis is commoner in the male sex, but most recent papers on the subject fail to support this contention. I have collected 51 cases admitted to the London Hospital between 1911 and 1924,[10] and of these 31, or 68 per cent., occurred in females. With regard to the predisposing influence of age, the commonest decade is the fifth, but the age-incidence varies within wide limits, and in this series the youngest was a girl of 11 and the oldest a female of 73.

Until recent years the diagnosis of this condition was unusual before the abdomen was explored on the operating table. More careful attention to clinical features now results in accurate diagnosis in the majority of cases. The sudden onset, continuous vomiting, and cyanosis are all suggestive. As with perforation of an ulcer, marked prostration is also present, and as Moynihan points out, "shock" is an incorrect term to apply to this condition, as it is not associated with marked diminution of the blood pressure. Abdominal rigidity varies inversely to the degree of prostration, and therefore is absent for a variable time after the onset of infection—i.e., during which period the prostration is still profound.

Special tests have naturally little scope for application in emergency surgery, but the adrenalin mydriasis test of Loewi may be of value in establishing a diagnosis. Positive results were obtained by Waring and Griffiths in three out of four cases, and by Hamilton Bailey in four cases out of five. The diastase index of the urine is of no significance, as it may be increased in other acute abdominal conditions—e.g., pneumococcal peritonitis. The previous history of many cases of acute pancreatitis is of interest in that it indicates that the condition may be progressive, and that less severe attacks sometimes precede the final catastrophe. Excluding as carefully as possible attacks of abdominal pain due to other causes, in this series of 51 cases no less than 31 gave a history of previous similar attacks and five were inconclusive, leaving a residue of 15 patients whose first attack needed surgical intervention.

A striking example of a successive attack was a case in which laparotomy was performed for abdominal pain of obscure origin. A condition of "chronic pancreatitis" was diagnosed and the abdomen closed. One month later the patient was hurriedly returned from convalescent home with an attack of acute hæmorrhagic pancreatitis, which was confirmed at post mortem. An even more illuminating instance of the recurrence of the condition with increasing severity may be quoted in more detail:—

Case of A. B., brewer's drayman.

1907: Aged 36. Was suddenly seized with acute abdominal pain. The diagnosis of "acute alcoholic gastritis" was made, and the patient attended the medical out-patient department. He was discharged a few weeks later as cured.

1910: Drank a glass of cold water and was suddenly seized with severe pain, similar to previous attack, vomited several times, and was admitted to hospital. On examination some tenderness and rigidity was present over the gall-bladder area. The symptoms abated and he was discharged.

February, 1924: Third severe attack while rolling barrels. Pain so acute that patient became unconscious. On admission to hospital prostration was well marked, cyanosis was present, and rigidity was entirely absent. A diagnosis of acute pancreatitis was made, and the abdomen opened through a right paramedial incision. Fat necrosis was general, the pancreas was swollen and œdematous, and the gall-bladder was distended, but no stones were present. Cholecystostomy was performed and the patient recovered.

July, 1924: The patient was seized with a fourth attack similar to those described above. He was admitted moribund and died shortly afterwards.

Causation.

The causation of acute pancreatitis is still obscure. The two theories most commonly held are either infection by lymphatic spread, or regurgitation of infected bile along the pancreatic duct. Experimental work, such as the injection of organisms into the neighbouring lymphatic glands, has failed to support the theory of lymphatic spread, although this route is still suggested in cases in which the biliary passages are healthy. Regurgitation of infected bile is almost self-evident in cases in which the ampulla of Vater is obstructed by an impacted gall-stone, and acute pancreatitis has also been associated with sarcoma of the ampulla, and, as in a case reported by Sir Hugh Rigby,[11] followed blockage of the duct by a round-worm. Even in cases in which no gall-stone or other obstruction is present, the regurgitation theory may still be accepted on the assumption that reflex spasm of the sphincteric muscle of Oddi diverts the flow of bile along the pancreatic duct, the stimulus precipitating the reflex being some other pathological condition or derangement within the abdomen.

Among the post-mortem records of the London Hospital there are reports of two cases of death due to strangulation, both of whom showed fat necrosis in the region of the pancreas. This association suggests that venous stasis may possibly predispose to acute pancreatitis. Over 50 per cent. of cases of acute pancreatitis are associated with cholecystitis or gall-stones, and many of the remainder with some other abdominal focus of infection. As a free communication exists between abdominal lymphatics, adenitis of the subpyloric glands in the head of the pancreas may result from abdominal infection, particularly biliary. It is possible that enlargement of these glands obstructs the venous return from the pancreas. Again, acute pancreatitis is relatively more common in those of alcoholic tendency, and the resulting gastritis may be an additional cause of adenitis of the pancreatic glands. Furthermore, obesity definitely predisposes to acute infection of the pancreas, and excessive fat encourages generalised venous stasis.

Surgical Treatment.

With regard to the surgical treatment of acute pancreatitis three operative measures are commonly adopted. These are: 1. Local drainage of the pancreatic area. 2. Drainage of the gall-bladder or biliary passages. 3. Incision and drainage of the pancreas itself.

I have collected from hospital records and published statistics 52 cases in which one of these three procedures has been adopted, excluding those cases in which a combination of measures was deemed necessary. Out of 18 in which local drainage only was adopted five died—that is, a mortality of 28 per cent. In 28 cases drainage of the gall-bladder or common bile-duct was performed with 11 deaths—that is, a mortality of 39 per cent. In all these cases either gall-stones or previous infection of the gall-bladder was present. These figures suggest that the prognosis is worse if pathological conditions of the biliary passages coexist.

In six cases the pancreas itself was incised and drained; five of these terminated fatally—that is, a mortality of 83 per cent. These are scanty figures, and possibly in these cases infection may have been more advanced or extensive, so that incision of the gland was considered necessary. However, incision, or even stabbing the gland with blunt forceps appears to be inadvisable for the following reasons:—

1. Incision causes local hæmorrhage and superimposes trauma on infection.

2. Non-infected areas are exposed to infection and incision encourages the spread of infection to healthy parts of the gland.

3. The pancreatico-duodenal arteries may be injured, and cases of duodenal fistulæ have occurred after incision of the gland.

These figures suggest that in all cases of acute pancreatitis it is wise to incise the peritoneum carefully over the pancreas so as to avoid injury to the gland. If the gall-bladder contains stones, is fat-laden, or its colour other than the normal slate-blue, then cholecystostomy should be performed in addition to drainage of the pancreatic area. Mere distension of the gall-bladder should be ignored, as one would expect œdema of the head of the pancreas to cause some degree of obstruction to the common bile-duct. Archibald [12] has suggested that the sphincter of Oddi might be divided transduodenally in order to overcome spasm and relieve possible tension in the pancreatic ducts.

It has been shown experimentally that relaxation of the sphincter is produced by painting the duodenal mucosa with a weak solution of magnesium sulphate (which possibly explains the beneficial effect attributed to the early morning dose of salts). However, it would seem more practical to inject with a syringe and fine needle a few cubic centimetres of a 5 per cent. solution of magnesium sulphate into the first part of the duodenum. This manœuvre would be free from danger and occupy but a moment. Presuming that spasm of the sphincter is in certain cases the actual, or even a contributing cause of acute pancreatitis, and that the physiological relaxation of the sphincter is obtained under pathological conditions, then intra-duodenal injection of magnesium sulphate should produce a beneficial effect.

With regard to drainage of the pancreatic area the drainage-tube should be wide in calibre, as surprisingly large sloughs may separate and these need a roomy exit. In cases which survive the first week some anxiety may arise during the ensuing days on account of this sloughing of masses of pancreatic tissue which may be associated with some degree of secondary hæmorrhage, in addition to the difficulty of their discharge along the path provided.

The tube itself should emerge through a separate stab wound rather than through the laparotomy incision, as pancreatic enzymes, activated by mild infection, may cause early disintegration of catgut or weakening of the scar with consequent breaking down of the wound, which may need secondary suture, or later cause an incision hernia. Posterior drainage of the pancreas may be obtained either by an incision below the twelfth rib on the left side, or after resection of part of the tenth left rib. This route is unlikely to be practicable in cases of acute infection as, if adopted as a primary measure in diagnosed cases, the surgeon remains in ignorance regarding the condition of the gall-bladder, and only limited drainage can be obtained in the region of the tail of the pancreas. If the abdomen is already opened from the front then the acquisition of posterior drainage necessitates further incisions, and change of posture in a patient whose condition already causes anxiety. In cases of pancreatic cyst the advisability of posterior drainage should certainly be considered.

With regard to after-treatment, reference has already been made to the digestive properties of the fluid discharged, and excoriation of the surrounding skin should be prevented by some mineral fat, if necessary containing a weak acid in order to prevent activation of the enzyme.

Owing to the pancreatic deficiency which naturally follows destruction and infection of at least a portion of the gland, pancreatised food or some pancreatic preparation must be given in order to maintain adequate nutrition of the patient. In this connexion it will be recalled that persistent abdominal discomfort and dyspepsia is sometimes a troublesome sequela after cholecystectomy for gall-stones. Many of these cases are relieved by pancreatic preparations, owing to the association of chronic pancreatitis and pancreatic deficiency with infection of the biliary passages.

Glycosuria is an occasional sequela to acute pancreatitis, and in one case the urine contained 2·5 per cent. of sugar, one month after operation. Possibly chronic pancreatitis had previously affected the islands of Langerhans. The possibility of glycosuria should be borne in mind so that a suitable medical régime may be instituted if necessary. Reference has already been made to the contention that mild attacks of acute pancreatitis commonly precede a surgical catastrophe, and the corollary is also true; thus subsequent attacks may occur in a patient who has already been tided over an acute attack by a timely operation. In one case in this series a recurrent attack occurred while the patient was still in bed, 22 days after cholecystectomy had been performed for acute pancreatitis. The attack abated under the influence of morphia.

In reviewing the series of cases which form the basis of this paper, it appears that recurrent attacks are commoner in cases associated with gall-stones and cholecystitis. This suggests that when once pancreatic infection is established then an infected condition of the biliary passages predisposes to reinfection of the pancreas.

IV.—SPINAL ANÆSTHESIA.

Methods of anæsthesia other than induction via the respiratory passages are much less popular in this country than on the continent. In many French schools splanchnic anæsthesia is used almost as a routine for abdominal work. In this country spinal anæsthesia is most commonly used in cases in which

cardiac or pulmonary conditions constitute an additional risk to the administration of a general anæsthetic, and this method is commonly considered undesirable in cases of shock or diminished blood pressure, as owing to complete relaxation of the abdominal wall splanchnic stasis is encouraged.

Most of the instances in which fainting or collapse of the patient causes anxiety or alarm are readily preventable by posture. After a period of seven to ten minutes, during which the anæsthetic becomes fixed to the nerve elements, the table should always be tilted so that the head is lowered. In gynæcological operations under spinal anæsthesia conducted in the Trendelenburg position the condition of the patient seldom gives rise to concern. The effect of posture should always be borne in mind, not only during but also after the operation. I have seen sudden collapse of a patient on the stairs of a nursing home, down which she was being carried feet first. Lack of this simple precaution has caused calamities which tend to bring a valuable measure into disrepute. If considered advisable an additional precaution may be obtained by auto-infusion—that is, firmly bandaging the patient's limbs so as to limit the amount of blood in the systemic circulation.

A somewhat inexplicable and fortuitous advantage of spinal anæsthesia occasionally occurs in cases of paralytic ileus. On two occasions I have seen copious relaxation of the bowels occur on the operating table within a few minutes of injection, and other surgeons have experienced this happy result.

Cases of acute intussusception furnish an excellent instance of the advantages of spinal anæsthesia. It has been suggested that owing to the relatively longer spinal cord in infants that this structure is endangered. However, it will be recalled that even at birth the spinal cord only reaches to the upper border of the third lumbar vertebra, so that an injection at the usual site—that is, between third and fourth lumbar vertebræ—is obviously devoid of risk. In semi-shocked infants under general anæsthesia a narrow margin separates muscular rigidity from surgical relaxation, and a safe yet efficient degree of anæsthesia is difficult to maintain even with a skilled anæsthetist, and emergency surgery frequently precludes expert assistance. The operation for acute intussusception under indifferent anæsthesia results in excessive escape of bowel, ungentle manipulation and delay, and difficulty in suturing the parietes. It is still a tradition in some hospitals that in order to limit the risk of a "burst abdomen" the stitches in cases of acute intussusception are not removed until the twelfth day instead of the usual tenth day. If the child is incompletely anæsthetised the task of systematically approximating the peritoneum and parietes may be insurmountable, and recourse may, of necessity, be made to simple through-and-through suture. This crude procedure must obviously predispose to subsequent ventral hernia, and in addition cases of obstruction from adherent bowel have been reported.

Hamilton Bailey,[13] in an amplified personal communication, reports 16 cases of acute intussusception induced under spinal anæsthesia, with one death, and have personal notes of 23 cases treated on these lines with three deaths, in two of which the gut was gangrenous. In none of these 39 cases was difficulty experienced in suturing the abdominal wall, nor did subsequent healing give rise to apprehension. Furthermore, complete relaxation undoubtedly saved time and trauma in manipulation and suturing, and improved the prognosis in many cases.

With regard to the technique of administration of novaine in children, the usual dose for a child between six months and one year is 0·2 c.cm., which amount may be varied according to the weight of the child. The Barker's needles commonly used for spinal puncture are too large, and a shorter and finer needle should be substituted. The syringe must be plainly graduated so that the dose can be accurately measured. After injection the child may be placated by being allowed to suck a strip of gauze moistened with glycerine.

In conclusion, I would advocate the more general use of spinal anæsthesia in acute abdominal surgery, provided that the necessity of posture is constantly borne in mind. In acute intussusception in particular, the ease and gentleness of manipulation and speedy efficient closure of the abdomen undoubtedly diminishes both the immediate operative mortality and the risk of sequelæ and complications associated with imperfect suture of the abdominal wound.

Finally, I must express my indebtedness to various surgeons at the London Hospital for their ready permission to amass statistics from cases under their care and treatment.

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INTRAVENOUS ANTITOXIN IN SCARLET FEVER.

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OBSERVATIONS on the treatment of scarlet fever by the specific antitoxin have been made by a number of workers, both in America and in this country, during the past three or four years. Their reports are, however, chiefly based upon the results of subcutaneous or intramuscular injection of the serum, and the intravenous route has, we believe, been employed only in relatively few severe or toxic cases. The results obtained are concisely summed up in Sir George Newman's Annual Report for 1927. "Scarlet fever antitoxin is being increasingly used and has proved effective in the treatment of this disease. Although it appears to have no direct effect on the cure of complications, its early administration lessens the toxæmia, and cases so treated have shown less tendency to develop septic complications. Its use reduces the average stay in hospital and should assist in reducing the number of hospital admissions. A small dose, 2·5 c.cm. to 5 c.cm. of the concentrated serum, can be used to confer a temporary passive immunity of from one to two weeks' duration on the immediate contacts of the case." This general statement of the present position may be supplemented by reference to certain details dealt with by J. C. B. Craig[1] in a recent comprehensive paper on this subject. Craig describes the results obtained in Edinburgh by intramuscular injection of the serum in a series of 500 cases, mostly of a mild type, with controls. The following important practical points, amongst others, were brought out:—

1. Beyond the third day of the disease, antitoxin seems to have little effect in influencing the incidence of subsequent complications.

2. The incidence of otitis media in cases treated with serum during the first three days of the disease was 8·3 per cent.

3. It does not seem advisable to reduce the quarantine period to less than four weeks. Fresh complications developed after the fourth week of disease in 14 serum-treated patients.

From the figures quoted, it appears that the average stay in hospital of the serum-treated cases was

[1] THE LANCET, 1928, ii., 1123.

almost five weeks, and of the control cases, almost seven weeks.

Rather better results from intramuscular injection were obtained by E. H. R. Harries,[2] who reported a 2 per cent. incidence of otitis media in Birmingham in 100 serum-treated cases, as compared with 9 per cent. in the control series. Harries considered that, although many serum-treated cases appeared to be ready for discharge from hospital in three weeks from the onset, "at the present stage it seems inadvisable to discharge them earlier than 30 days from onset."

Results of Intravenous Injection.

The present communication deals with the results of intravenous injection of scarlatinal antitoxin in 404 cases of scarlet fever treated in the City of Leicester Isolation Hospital during the seven months May to December, 1928. Before this period we had commonly employed the serum intramuscularly with results somewhat similar to those referred to above. In the hope of obtaining better results we began to inject intravenously. It soon became evident that by this means the acute stage of the disease could be still more curtailed, complications prevented, and the stay in hospital still further materially reduced. A period of high epidemic prevalence of the disease occurred during the period of the experiment, and it became necessary to utilise existing hospital accommodation in the most economical way. We therefore came gradually to use intravenous injection as the routine method of treatment for all definite cases admitted in the acute stage, even up to the fifth or sixth day of disease. Certain exceptional cases were, however, recognised. Children under the age of two years were generally judged too young for intravenous injection. In cases with a history of asthma or other form of protein sensitiveness, or with definite bronchitis or acute respiratory disease, intravenous injection was held to be contra-indicated on account of protein shock. In some other cases difficulty was encountered with a vein. To all falling into those categories intramuscular serum was given. Doubtful cases were given 3 or 4 c.cm. intramuscularly, either for prophylaxis or treatment. Cases admitted late in the disease, and some very mild cases, were treated without serum.

The actual allocation of all cases amongst these groups during the period May to December, 1928, was :—

Cases treated with antitoxin intravenously ..	404
,, ,, ,, ,, intramuscularly ..	68
,, ,, ,, ,, ,, as prophylactic	20
,, ,, without antitoxin	240
Total cases discharged during the period ..	732

The proportion of serum-treated cases rose steeply during the later months as experience developed.

The effect of intravenous injection on the acute stage was almost invariably dramatic, even up to the fifth day of the disease. In a few cases (16) it was given on the sixth day with good results. When the patients were seen the next morning they were generally reading a book unconcernedly. The temperature had fallen below the normal line, the rash had faded, and œdema of the throat had subsided; there was no complaint of sore-throat, and they said they felt "much better." Practically the only patients who failed to respond quickly were those in whom dosage was considerably below the standard finally adopted.

We experimented during November with doses of about half the standard amounts. We found that cases receiving these smaller doses did quite well; they had very few and minor complications, and their average period of residence exceeded that of the October cases only by two days—i.e., 17½ days—but they did not have quite the same dramatic cessation of the acute stage as was associated with the full effective dose. The following chart (Fig. 1), selected at random, is quite typical of the great bulk of our cases.

As experience grew, we gradually shortened the average period of residence in hospital of the intravenous cases to about 15 days. Some were ever discharged after 9 or 10 days.

FIG. 1.

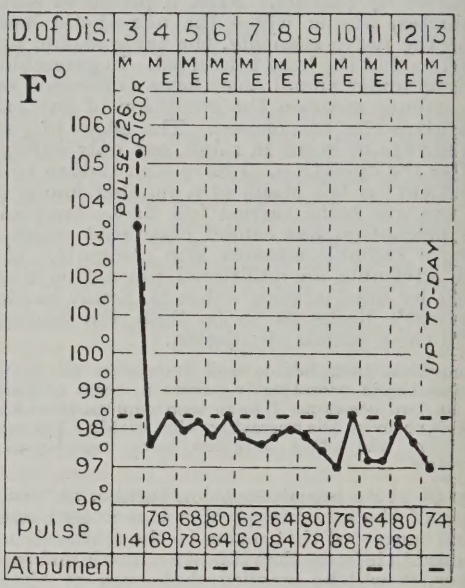


Chart showing effect of intravenous antitoxin in scarlet fever.

We soon observed that the complication-rate in intravenous cases was practically negligible, being limited to a very few minor septic manifestations. In actual fact, there was not a single instance of the more serious complications—viz., acute otitis media, nephritis, and arthritis. In order to be certain that complications were not occurring after discharge we made arrangements for all serum-treated cases to attend at the health offices for medical examination two or three weeks after discharge. The examination included a urine test for albumin. Out of 368 cases who were asked to attend, 334 actually appeared. The relevant defects noted were few and unimportant—viz., two cases of mild secondary tonsillitis and five with minor skin sepsis. No nephritis, albuminuria, or otitis occurred. Almost without exception these patients turned up cheerfully to report that all was well. We soon realised that the morbidity associated with scarlet fever was being materially reduced, permanent damage altogether prevented, and the loss of hundreds of weeks of school time for children and of business time for adults was being obviated.

From the administrative point of view the result of the experiment was no less gratifying. In the year 1928 there were 1972 notifications of scarlet fever in Leicester, the highest number recorded for 22 years. Had it not been for the new method of treatment it would have been impossible to accommodate all the cases that required hospital treatment without, at least, gravely interfering with other departments of hospital activity. As a matter of fact, the usual ward accommodation allotted to scarlet fever was not increased at any time, and we were able to hospitalise in this ward space about three times the number of cases usually dealt with. That infectivity was apparently not increased is shown by the fact that the number of "return" cases—i.e., cases appearing in a home within two months of the return home of a patient from hospital—was 12 for the period, or 1·6 per cent., which is rather below the usual figure of about 2 per cent.

[2] Medical Officer, 1927, xxxviii., 153.

The one unfavourable circumstance was a death, tributable mainly to protein shock after intra-nous injection of serum. This occurred in a weakly ild who was suffering from acute bronchitis. The se is described below.

Fig. 2 sets out the salient points relative to the vestigation.

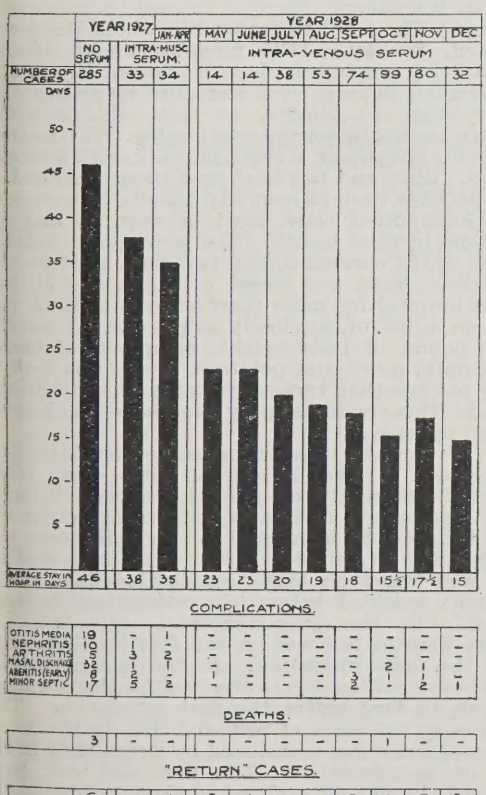
Special Features.

Certain additional points of interest were noted in e series of 404 intravenous cases.

Type of Scarlet Fever.—The prevailing type was ild. There were, however, a fair number of sharp ses, particularly among adults. Only seven cases ere definitely noted as being septic, and even in ese the sepsis subsided after a few days. Probably good many more would have become septic had the ute stage not been so dramatically arrested by travenous antitoxin.

Administration and Dosage of Serum.—Three different akes of serum were employed for intravenous jection in the early stages, and as the best results peared to be obtained with Parke, Davis and Co.'s ncentrated serum, this was used exclusively after e first 20 cases. Generally the effective dose was und to be about 20 c.cm. intravenously for an adult for a severe septic or toxic case, and 10 c.cm. for child or a moderate case. Rather smaller doses an these were given for milder cases. When several ses in a ward are being injected at the same time, e serum, which is issued in 10 c.cm. phials, can be ed economically by giving the fractions of a phial itable for each case—e.g., 5 to 7 c.cm. to a fairly ld case in a child, 10 c.cm. to a severer case in a ild, 13 c.cm. to a fairly mild case in an adult, and

FIG. 2.



t showing effect of intramuscular and intravenous antitoxin duration of residence in hospital, and on complications, aths, and "return" cases. During the period January to ril, 1928, there was one death—a septic case which was not ated with serum. Only cases treated intravenously have en shown for the period May to December, 1928; these stituted the great bulk of the cases.

20 c.cm. to a severe case in an adult. The warmed serum was slowly introduced undiluted into the median basilic vein by means of a 10 c.cm. or 20 c.cm. record syringe with peripheral nozzle. Before injecting the serum a few drops of blood were withdrawn

FIG. 3.

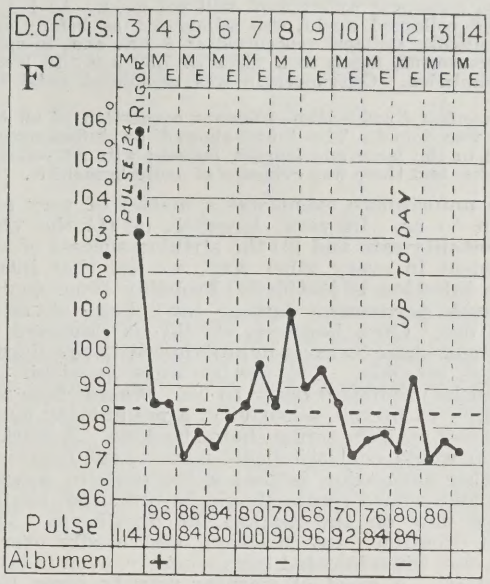


Chart showing secondary pyrexia following intravenous antitoxin in scarlet fever.

into the syringe. In work of this kind it is essential to have a good supply of short sharp, rigid needles of suitable bore and with fairly short points. A good light over the arm is another essential, and it makes for rapid working if there are a number of record syringes available, and a staff trained to wash out and boil the used syringes between injections. When the requisite organisation has been attained in a ward, it is not difficult to do seven or eight intravenous injections in an hour. Sometimes there was difficulty with a vein in a young or fractious child, and in such cases little time was wasted and the serum was injected intramuscularly.

Immediate Serum Reaction.—The intravenous injection is followed in fully 60 per cent. of the cases by a rigor and rise of temperature (which may be as high as 107° F.) within three-quarters of an hour. The colour is not infrequently poor and the pulse rapid. This reaction passes off within about half an hour, and the patient then generally falls asleep. Accordingly, in all cases, as soon as the injection was given, the foot of the bed was raised and the patient was surrounded with hot bottles and blankets until the rigor had passed off. Subcutaneous injection of adrenalin ℥iii. to ℥viii. prophylactically, as soon as the first signs of the protein reaction appeared, was apparently of value in mitigating the reaction. Adults were given nepenthe ℥xxv. or ℥xxx. as a routine as soon as the reaction had passed.

Record of a Fatal Case.

As noted above, one death occurred, apparently due to protein shock, associated with acute bronchitis. The circumstances were these:—

E. M., female, aged 4 years, admitted Oct. 12th, 1928, on the third day of the disease, had a short moist cough. The rash was well marked, the tongue was "white strawberry," and the fauces were intensely injected and showed some muco-purulent exudate. The pulse-rate was 138 and the temperature 100·8° F. On examination of the lungs, rhonchi were heard over all the lobes and fine moist râles were present at both bases. She was given 10 c.cm. of scarlatinal antitoxin intravenously at 7 P.M. At 7.45 P.M. she had a severe rigor, followed by profuse sweating and

collapse. At 8.15 P.M. the pulse was thready, the colour very poor, the pupils contracted, and the eyes turned upwards and squinting, and there were convulsive twitchings of the face and limbs. Half a cubic centimetre of adrenalin was given intramuscularly, followed by a hypodermic injection of camphor, ether, and olive oil, and then a pint of subcutaneous saline. The acute emergency passed, and the child appeared moderately comfortable after an hour, although pulse and colour were still not good. At 1 A.M. the child collapsed again, was stimulated as before, and again rallied. Collapse reoccurred at 5 A.M. and, in spite of all treatment, death took place at 7.30 A.M., 15 hours after admission. Consciousness was unclouded until the end.

Post-mortem Examination.—Venous congestion of all the organs was found. The lungs showed an inflammatory exudate in the large and smaller bronchi without collapse of vesicles, and there was evidence of acute bronchitis.

This unfortunate event was a matter of very real concern to us. In view, however, of (1) the very low mortality-rate and (2) the striking success of the experiment in every other way, we feel that intravenous injection is justified. Probably some deaths and much permanent damage have been obviated by its use. Care, however, should be exercised at the present stage to exclude protein-sensitive subjects as far as possible. Two further ways in which the risk can be minimised occur to us. Where there is a possibility of protein-sensitivity, a preliminary intradermal test with the serum should be done. A marked reaction would contra-indicate intravenous injection. The other suggestion is that a low-protein, concentrated and refined serum should be produced, similar to that now on the market for diphtheria. This seldom occasions any reaction, and hardly ever a severe one, when injected intravenously, even in large quantities. A word of warning may be given here against mixing different makes of serum when injecting intravenously. We believe this to be highly dangerous.

Serum Rashes.— These were very infrequent, occuring only in 11 cases, or 2·8 per cent.

Secondary Pyrexia.—This was a peculiar feature which occurred in 33 cases, or 8 per cent. of the series. It consisted of a three-day pyrexia of 100° F. or more, commencing on the fourth day after admission. Sometimes headache was present, but otherwise there was no complaint. No tonsillitis, adenitis, or other evidence of acute inflammation could be found. The condition appeared to us to be a mild and limited recurrent toxæmia, and seemed to exert little or no adverse influence on the patient. A typical chart (Fig. 3) showing this secondary pyrexia is here reproduced.

Desquamation.—This was generally absent when the antitoxin was given within the first four days of the disease, and slight thereafter, unless the rash was very intense. Since mucous or purulent discharges were practically absent, no importance was attached to desquamation in judging fitness for discharge.

Dick Test.—One hundred cases were Dick-tested just before their discharge—i.e., 15 to 20 days from the onset. Of these, 88 were negative and 12 positive.

Effect on Ward Routine.—This was very marked. Practically no nursing was required after the day of admission. The constant routine work of attending to septic throats, noses, glands, and skin was almost entirely eliminated, and considerable economy of nurses' time was effected.

Effect on Hospital Accommodation.—The reduction of the average stay in hospital to just over a fortnight enabled us to deal easily with a very considerable epidemic. Within a fortnight after the epidemic began to subside we were able to close one ward block, so rapidly were the patients discharged. In future it should be possible to allocate to other purposes half the ward accommodation previously reserved for scarlet fever.

Cost.—The cost of serum per case works out at about 15*s.* This is much more than counterbalanced by the saving effected in the reduction of patient days, staff, staff accommodation, &c.

Summary and Conclusions.

1. Intravenous antitoxin administered in the acute stage of scarlet fever stops the acute process within a few hours, prevents complications and permanent damage to health, and greatly reduces the period of residence in hospital and of abstention from work or school.

2. Certain cases should, however, be excluded until a refined serum which will not give rise to protein shock becomes available.

BLOOD-CHOLESTEROL DURING THE MENSTRUAL AND EPILEPTIC CYCLES.

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(*Communicated on behalf of the Clinical and Laboratory Staff of the Cardiff City Mental Hospital.*)

A.—CHOLESTEROL AND MENSTRUATION.

IN a paper in THE LANCET by Robinson, Russell Brain, and Kay, on the Association of Low Blood Cholesterol with the Occurrence of Fits in Epileptics, the incidental statement is made, apparently upon the authority of Okey, that the blood-cholesterol is markedly decreased at or about the menstrual period. This statement we put to the test in our chemical research laboratory (Dr. R. V. Stanford and Mr. A. H. M. Wheatley).

Method.—The total cholesterol in whole blood was estimated, Sackett's 1925 modification of Bloor's method being employed, since Robinson, Brain, and Kay used this in their work and since we proposed at a later stage to inquire, as they did, into the cholesterol-epileptic-seizure relationship. This method has also the advantage of requiring only small amounts of blood. Okey and Boyden [2] used Bloor's method.

The patients were 12 mentally disordered women of the rate-supported class, aged between 22 and 47. They were in good health. Ten were quiet, deluded patients of the chronic class; two were quiet mental defectives. None was recent or acute, and all had been in hospital for more than one year. Each was placed on a diet of, as closely as possible, 17 calories to the pound of body-weight, composed of bread, butter, milk, meat, and potatoes. Each was kept in bed for not less than three days before the withdrawal of blood. These remarks apply likewise to the observations on epilepsy.

The 12 patients were examined for cholesterol in two phases of the menstrual cycle—viz., inter-menstrual (as nearly as possible midway between actual "periods") and intra-menstrual (during the actual time of the menstrual flow, commencing not later than the day after its inception). In each phase blood was taken on three consecutive days under conditions specified below (six estimations to each patient). In the inter-menstrual series all the patients were in bed and on the diet for three days before the first estimation. In the intra-menstrual series these conditions were observed for three or more days (up to ten) before the first estimation. The variation in the time of rest and diet in the intra-menstrual series was occasioned by irregularity in the dates of menstruation. The diet and rest were continued throughout each set of three estimations.

When the patients had all been examined in both phases of the menstrual cycle the observations were collectively known as Series A (72 estimations).

[1] Robinson, S. H. G., Brain, W. R., and Kay, H. D.: THE LANCET, 1927, ii., 325.

[2] Okey, R., and Boyden, R. E.: Jour. Biol. Chem., 1926, lxxii., 261.

the patients were then examined in both phases again, and the second group of observations was known as Series B (72 estimations; 144 estimations in all). The conditions in the two series differed as follows:—

Series A.—Blood taken 1½–2 hours after breakfast.

Series B.—Blood taken before breakfast, the patients being in the fasting condition from tea-time the day before.

In each series the time of taking the blood was about 10 A.M. The mean results of the two series are in most cases in agreement to within about 10 per cent. (in half the cases to within 5 per cent.). The agreement is somewhat closer in the inter-menstrual than in the intra-menstrual results.

Technique.—The blood was collected in prepared tubes, as follows:—

After applying tincture of iodine to the skin several c.cm. (2–8, according to the condition of the patient) were withdrawn from the superficial veins of the forearm with a 10 c.cm. sterile serum syringe, and this blood was immediately transferred to a test-tube containing about 10 mg. of lithium oxalate, and was thoroughly mixed.

Observations.

The green colour developed from the cholesterol which is used for the colorimetric comparison is very variable in shade, sometimes being yellowish-green and at other times bluish-green. This variability often makes an exact colour-comparison impossible, so that a large number of the results obtained can only be regarded as doubtful. Some of the variations found may be due to actual changes in the amount of blood-cholesterol; some, on the other hand, are undoubtedly due to the uncertainty of the colorimetric comparison, and in deciding the reliability of any particular result it is impossible to differentiate between the two causes of variation.

Table I. is based upon the figures representing the amount of cholesterol in hundredths of a milligramme (cmg.) per 1 c.cm., which corresponded with the colorimetric readings. In each of the 12 cases is shown the percentage variation of the maximum and minimum results from the mean of the three results obtained.

TABLE I. (*from Series B*).

Case No.	Inter-menstrual.			Intra-menstrual.		
	Mean.	Max. percentage above mean.	Min. percentage below mean.	Mean.	Max. percentage above mean.	Min. percentage below mean.
24	184	7	10	171	7	12
25	146	0	0	154	11	8
26	167	9	13	157	3	2
27	136	1	1	136	2	2
28	192	1	1	203	2	4
29	155	3	3	149	5	3
30	184	3	3	176	2	3
31	198	4	4	198	3	3
32	149	3	5	153	8	4
33	146	1	1	153	10	12
34	139	2	2	155	2	1
35	169	4	4	170	11	6

Robinson, Brain, and Kay (loc. cit.) obtained the following results on 32 normal female cases: maximum, 243; minimum, 152; mean, 175.

TABLE III.—*Cholesterol in Hundredths of a Milligramme per c.cm. of Whole Blood.*

—	32 normal cases.	12 female mental patients.
Maximum ..	243	206
Minimum ..	152	134
Mean ..	175	163

It will be seen that the figures obtained by us are somewhat lower than the normal values. Our series shows that the amount of cholesterol present in the blood is the same in the inter-menstrual as in the intra-menstrual period.

Table II. compares the amount of cholesterol in cmg. per c.cm. in the inter- and intra-menstrual phases in the 12 cases, the mean of the three sets of figures being given in each case for each phase. (Series B is alone dealt with; Series A is practically in agreement, and is therefore not printed.)

TABLE II. (*from Series B*).

Case No.	Inter-mens. mean.	Intra-mens. mean.	Percentage change.*	Case No.	Inter-mens. mean.	Intra-mens. mean.	Percentage change.*
24	184	171	−7	30	184	176	−4
25	146	154	+5	31	198	198	0
26	167	157	−6	32	149	153	+3
27	136	136	0	33	146	153	+5
28	192	203	+6	34	139	155	+12
29	155	149	−4	35	169	170	0

Mens. = menstrual. * Rise +, Fall −.

B. CHOLESTEROL AND EPILEPSY.

Robinson, Brain, and Kay found from their study of 11 cases that in 10 the cholesterol-level, both in blood and plasma, fell in the pre-convulsive period, and the fits took place at or about the lowest point in a curve plotted to show the amount of cholesterol at regular intervals.

We examined the cholesterol in the whole blood of six cases (three males and three females) of long-standing epilepsy, with dementia to a greater or lesser extent. In each case three estimations were made in the inter-paroxysmal and three in the pre-paroxysmal phase (36 estimations in all). The time which elapsed between venesection and the fit (pre-paroxysmal period) is set out for each case in Table V. The inter-paroxysmal results (Table V.) were obtained in blood drawn at a time when the patients had been free from fits for some days.

TABLE IV.

Case No.	Sex.	Inter-paroxysmal.			Pre-paroxysmal.		
		Mean.	Max. percentage above mean.	Min. percentage below mean.	Mean.	Max. percentage above mean.	Min. percentage below mean.
37	F.	144	3	6	156	10	6
38	F.	155	10	5	143	2	2
39	F.	208	1	1	185	11	21
8	M.	142	3	4	133	5	3
40	M.	131	2	1	124	6	3
36	M.	136	4	2	139	5	6

TABLE V.—*Results are Expressed in cmg. per c.cm. of Blood.*

Case No.	Sex.	Inter-paroxysmal mean result.	Pre-paroxysmal, percentage variation from inter-paroxysmal.	Time between venesection and fit.	Case No.	Sex.	Inter-paroxysmal mean result.	Pre-paroxysmal, percentage variation from inter-paroxysmal.	Time between venesection and fit.
				hrs.					hrs.
37	F.	144	+ 3	9	8	M.	142	− 9	4
			+ 2	6¾				− 8	5½
			+19	9½				− 1	16¾
38	F.	155	− 7	7	40	M.	131	+ 1	5¼
			− 6	11¼				− 8	4¼ & 7¼
			−10	¾				− 8	16
				mins.					
39	F.	208	−30	5	36	M.	136	− 4	5
			− 1	5				+ 7	22
			− 2	0				+ 4	5½

+ = higher than inter-parox. — = lower than inter-parox.

In five out of the six cases the blood-cholesterol in the inter-paroxysmal phase was fairly constant over the three days on which estimations were made;

in the sixth case (38) one of the values was considerably higher than the other two; hence the variation of the maximum and minimum from the mean was more marked than usual (Table IV). In four out of the six cases the blood-cholesterol in the pre-paroxysmal phase was fairly constant over the three days on which estimations were made; in the two remaining cases (37 and 39) the variation was more marked (Table IV.). It is impossible to say with certainty whether the variations are due to changes in the cholesterol content of the blood or to the unreliability of the method of estimation.

It will be seen from Table IV. that the mean value for the blood-cholesterol in the pre-paroxysmal phases is not markedly different from that in the inter-paroxysmal phases. The variations from the mean tend to be greater in the former.

In Table V. the results are set out in rather greater detail; the percentage variation of each pre-paroxysmal result from the mean inter-paroxysmal result is given, and also the time which elapsed between the venesection and the fit. This table shows that the pre-paroxysmal cholesterol usually tends to be slightly lower than the inter-paroxysmal value. The only marked variations are the 30 per cent. fall in Case 39 and the 19 per cent. rise in Case 37.

Table IV. shows the mean result and also the percentage variation of the maximum and minimum from the mean in the inter- and pre-paroxysmal phases for each patient. Results are expressed in hundredths of a milligramme (cmg.) per c.cm. of blood.

My thanks are due to my medical colleagues, Dr. H. A. Scholberg, Dr. J. S. I. Skottowe, Dr. J. S. Allen, and Dr. Muriel Northcote, for their coöperation. This work has been done on behalf of the Medical Research Council, for whose financial assistance my best thanks are due.

Clinical and Laboratory Notes.

A FURTHER CASE OF *BRUCELLA ABORTUS* INFECTION IN MAN.

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THE physician and bacteriologist in coöperation have thrown much light during recent years upon the causation of those clinical syndromes in which an unexplained pyrexia has been the major feature. In certain of these cases the Brucella group of organisms in the form of one or other of its principal members—*Brucella melitensis* or *Brucella abortus*—has been directly implicated. The former organism primarily infects the goat and by transmission from that animal gives rise to Malta fever in man; the latter, a cause of contagious abortion in cattle, reaches the human being either through contact with contaminated uterine contents or—more commonly—in the domestic milk. Although during the last few years occasional cases of human abortus infection have been reported from Southern Rhodesia, Germany, Italy, and this country, the greater part of the work on the subject has been done in America and Denmark, where large series of cases have been collected and published by Kern[1] and Kristensen[2] respectively. English cases have been recorded by Bamforth,[3] Wordley,[4] Manson-Bahr,[5] Thompson,[6] and Harrison and Wilson,[7] and to these the following must now be added.

The Case Narrated.

The patient, aged 44, was a medical practitioner, engaged in institutional practice. He was a man of good physique, vigorous, and mentally active. His medical history included inoculation with T.A.B. in 1917 and attacks of variola major and lobar pneumonia at earlier dates. He had never been domiciled out of England except during a brief visit to Belgium in 1906, and the last eight years had been spent in more or less permanent residence at an institution two miles from Newcastle. His tastes were simple, his habits temperate, and the only one of importance and interest was that of drinking a half or even a whole pint of raw cow's milk every evening before supper. There was neither history of contact with goats nor of ingestion of their milk. The onset of his illness could be traced back definitely to Sunday, Oct. 7th, 1928, when he noticed some diminution in his ordinary robust health, and thereafter a steadily advancing malaise, which though increasing day by day, was not sufficient to prevent him from carrying out his duties. Throughout this period, which terminated somewhat dramatically on Oct. 15th, his feelings were those of lassitude, dullness, nausea, and anorexia. An intermittent headache and pain in the left foot when walking were more definite symptoms, the latter being apparently due to a plantar fibrositis. Although the temperature was never taken until Oct. 15th, there was a vague sensation of fever especially in the afternoon and early evening. Slight epistaxis occurred on one occasion, and there was evidence of some intestinal irregularity in that his daily normal stool was replaced by a single large loose evacuation. Before the night of Oct. 15th his sleep had been disturbed on one or two occasions by slight sweats, but on that evening a definite rigor, followed by excessive and exhausting perspiration, led to the taking of his temperature, which was found to be 99·6° F. From that time he remained in bed, and to his previous symptoms of malaise, headache, and anorexia there were added irritability, insomnia, and continuing fever. The morning temperature remained practically stationary at about 99° F., but these remissions were followed by afternoon exacerbations which, becoming progressively higher day by day, ultimately reached 102° F. The pulse lagged relatively behind the temperature, though there was never any indication of a true bradycardia. The drenching sweats, especially at night, continued, but the fibrositis disappeared, and the moderate diarrhœa was replaced by an obstinate constipation. These were the only symptoms and signs during the second week of the disease. At this stage he was seen by a consulting physician on whose advice a specimen of blood was submitted to a local laboratory for agglutination tests with the enteric group. The report of this investigation stated that the serum had agglutinated *B. paratyphosus* A solely, and that in a dilution of 1 in 50. In view of these findings the patient was admitted to the City Hospital for Infectious Diseases, Walker Gate, on Oct. 24th.

On admission his temperature was 100·6° F. and his pulse-rate 96. There were no signs of any clinical significance in the respiratory or nervous systems. The skin was clear and there was no evidence of present or recent rashes or herpetic eruptions. A decided congestion of the pharynx was apparent, and the tongue was dry and heavily furred. Examination of the undistended abdomen revealed some diffuse tenderness in the left hypochondrium and along the line of the descending colon. The spleen, though not palpable, appeared on percussion to have an enlarged area of dullness. The urine was apparently normal on investigation by the ordinary routine tests, and the diazo reaction of Ehrlich was negative. Adventitious murmurs were not audible at any of the cardiac valvular areas, though the heart sounds and pulse were softer than normal. Irregularities of rhythm were entirely absent. The systolic and diastolic blood pressures were respectively 110 and 80 mm. of mercury. A rough leucocyte count showed: total cells, 7500; polymorphonuclears, 4500 (60 per cent.), and a slight absolute increase in the small lymphocytes 2250 (30 per cent.).

Throughout the first week in hospital (Oct. 24th–31st) the patient's temperature continued to range from 98·4 to 103° F., but the evening elevations on the whole were lower and the morning remissions more definite. The sweats, however, persisted as an unpleasant and exhausting feature, and the pulse-rate still appeared to lag relatively behind the temperature. The bowels remained confined though the tongue cleaned, the pharyngitis abated, and the appetite improved. A certain degree of testicular tenderness and swelling was manifest throughout this time. The blood pressure increased slightly until the systolic and diastolic figures were 118 and 90 mm. of mercury. There was no evidence of any Addisonian pigmentation. The blood count showed: erythrocytes, 4,500,000; hæmoglobin 90 per cent.; colour-index, 1; leucocytes, total 6800, polymorphonuclears, 3100 (45 per cent.); eosinophils, 2

per cent.); small lymphocytes, 2500 (38 per cent.); ge lymphocytes, 750 (11 per cent.); transitional leuco- tes, 140 (2 per cent.).

Diagnosis.—Even on his admission to hospital the appear- ce of the patient (which was that of a mentally alert n interested in his condition), the spikey temperature, absence of rash, the meagre abdominal and intestinal ns, the negative diazo reaction, and the comparative ity of paratyphoid A fever in this country, all combined throw doubt on the original laboratory diagnosis. The idal reaction was repeated at the University of Durham cteriological Laboratory on Oct. 25th, when it was found at the serum agglutinated *B. paratyphosus* A and B in utions respectively of 1 in 25 (trace) and 1 in 25 (faint ce). Cultures of blood and fæces made on the same te, and again from fæces on the 30th were all negative the enteric group. In further Widal tests made on t. 31st, the serum diluted to 1 in 25 produced only a slight ce of agglutination with each of the three organisms, *typhosus*, *B. paratyphosus* A and B, and was completely gative in all other dilutions. It was considered that these glutination titres were compatible with a persisting or rexially reactivated immunity to the organisms in estion, consequent on the patient's inoculation against m 11 years previously. The diagnosis of an enteric ection was accordingly discarded. Certain other clinical restigations were undertaken—radiography of the chest, amination of the nasal sinuses, urine cultures, examina- n of blood films for malarial parasites—but the results of se, as also of a prolonged search for the presence of any m of occult or focal sepsis, were all negative.

On Oct. 31st the blood was tested against emulsions of . *abortus* and *Br. melitensis*, and the following results re obtained :—

TABLE I.

Organism.	Serum dilution.							
	1 in 25.	50.	125.	250.	500.	1000.	2500.	5000.
abortus ..	—	—	+	+	+	+	+	—
melitensis ..	+	+	+	+	+	+	±	—

These agglutinations were repeated on Nov. 6th with um which had been heated to 56° C. for half an hour, l also with unheated serum. (The object of heating the um was to ensure destruction of non-specific agglutinins— ., typhoid, dysentery, &c.) The results of these agglutina- ns are given in Table II., and upon them, in the absence

TABLE II.

(*a*) *Unheated Serum.*

ganism.	1 in 25.	50.	125.	250.	500.	1000.	2500.	5000.	10,000.
abort.	—	±	+	+	+	+	+	±	—
melit.	+	+	+	+	+	+	±	—	—

(*b*) *Serum Heated to 56° C for Half an Hour.*

abort.	—	±	+	+	+	+	±	—	—
melit.	+	+	+	+	+	+	±	±	—

ny caprine source whence *Br. melitensis* might have been nsmitted, the diagnosis of infection by *Br. abortus* made. On the same date (Nov. 6th) cultures of blood urine were made in accordance with the special technique cribed later in the article, and guinea-pigs were injected peritoneally with the patient's blood. The absolute of the diagnosis—namely, the isolation of the causal anism, which was sought by these procedures, was ortunately not obtained. This result was not entirely xpected, as the specimens had been taken towards the of the pyrexial period.

Further Progress.—The subsequent history of the case entirely uneventful. The temperature, having reached mal after a month, did not again exhibit any pyrexia, had been normal for over a fortnight when the patient discharged from hospital on Nov. 24th. With the tement of the pyrexia all the remaining signs and ptoms subsided. The sweating ceased, the orchitis inished, the spleen was no longer enlarged, and the od pressure gradually rose until on discharge the systolic diastolic pressures registered 128 and 90 mm. of mercury ectively. Treatment throughout was directly purely he alleviation of symptoms. Intravenous injection of curochrome had been decided upon in the event of a rn of the pyrexia.

Epidemiological Inquiry.

The patient was accustomed to drink at least half a pint, and frequently a pint, of milk every evening before supper. This was fresh, raw, often warm milk from the afternoon milking of the institutional herd of seven cows. In February, 1928, one of these cows had aborted without apparent cause, and though continuing for a period to give milk in moderate quantities it had ceased to do so about the end of September. No other cow in the herd had aborted, and all were in good health and full milk.

It was decided to submit the blood of all the animals of the herd to agglutination tests with the *abortus-melitensis* group and to carry out an inquiry as to the presence of such organisms in the milk. Local difficulties rendered this comprehensive routine investigation impossible, and it was reluctantly given up. It was found possible, however, to obtain a specimen of secretion from the aborted cow's udder (a liquid which at that date could hardly be called milk), and this was used as the material for further bacteriological investigations.

On Nov. 14th two female guinea-pigs were inoculated intraperitoneally with the fluid from the cow's udder. One, No. 1498, was given 5 c.cm. of the uncentrifuged material, and into the other, No. 1499, 1 c.cm. was injected. The guinea-pigs were killed on Dec. 28th, 1928. Both showed lesions suggestive of a Brucella infection, though actually the one receiving the smaller quantity gave evidence of the more marked lesions. No. 1498 showed definite enlargement of the spleen with dark nodules and a minor degree of enlargement of the lumbar glands. There was no sign of any metritis. No. 1499 showed very marked enlargement of the spleen with well-defined dark nodules. The lumbar glands were slightly enlarged, and inflammatory lesions with white necrotic centres were present in both horns of the uterus. The blood of both animals was kept for agglutination test and cultures were made from the two spleens and from the uterine lesions. A special culture medium—namely, the liver extract medium as used by Huddleston, Hadley, and Torrey,[8] but without the addition of gentian violet—was employed in sloped tubes. These tubes were inoculated in duplicate, one set being placed immediately into a closed glass vessel to which 10 per cent. by volume of carbon dioxide was added from a carbon dioxide cylinder as advocated by Theobald Smith.[9] All the cultures were incubated in the 37° C. incubator. The other batch of cultures which had not been put into the carbon dioxide chamber was examined next day. One of the tubes inoculated from the uterine lesions showed many colonies but none were present elsewhere. The colonies on this tube were then marked with a blue pencil and all the tubes were placed into the carbon dioxide chamber and reincubated. After three days' incubation there was some suggestion of growth, but it was not until the end of four days that the tubes were taken out and examined thoroughly. The tubes inoculated from the spleens all showed well-defined growth in the form of discrete round colonies which were dome-shaped, slightly yellow in colour, transparent, and easily emulsified. Microscopically they were found to consist of small non-motile Gram-negative bacilli. After subculture on to liver extract slopes and incubation in the carbon dioxide chamber a profuse growth was obtained, and from this an emulsion was prepared for agglutination tests. On further incubation a few similar colonies developed on the cultures from the uterine lesions. The blood of both animals showed well-defined agglutinins to both *Brucella abortus* and *Brucella melitensis*. (Table III.)

TABLE III.

(*a*) *To Br. abortus.*

Serum No.	1 in 25.	50.	125.	250.	500.	1000.	2500.	5000.	C.
1498 ..	+	+	+	+	+	±	—	—	—
1499 ..	±	+	+	+	+	+	±	—	—

(*b*) *To Br. melitensis.*

1498 ..	+	+	+	±	—	—	—	—	—
1499 ..	±	+	+	+	+	±	—	—	—

The organisms cultivated from the two spleens and the inflammatory areas in the uterus agglutinated to titre with the abortus serum supplied by the University of Oxford Standards Laboratory.

We may conclude, therefore, that the isolation of the organisms from the spleen and the presence of

agglutinins in the guinea-pigs' blood clearly showed that the cow from which the sample was taken was infected with *Brucella abortus*, and may presume that this animal's milk was the probable source from which our patient had been infected. We would add that we are well aware that the inoculation of milk into guinea-pigs is not necessarily the best and certainly not the quickest method of demonstrating *Brucella abortus* in cow's milk, but it has been definitely shown to be satisfactory, and at the time the material was obtained for investigation there was no suitable culture medium available.

Our thanks are due to Prof. Harold Kerr, medical officer of health of Newcastle-upon-Tyne, for permission to publish the report of this case, and for his interest in the investigation.

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A CASE OF *BACILLUS ABORTUS* INFECTION IN ENGLAND.

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IN view of the articles on this subject in THE LANCET of Dec. 29th, 1928, a brief account of a case diagnosed in 1927 may be of interest. The case was seen once only, in consultation with Dr. A. N. Heron of Bristol on Jan. 1st, 1927. She was nursed at her home.

The patient, a spinster aged 31, had complained for three weeks of rheumatic pains, irregular fever, and constipation. A complete record of her temperature was not available but, taken on alternate days, usually in the morning, it varied between 99·6° and 101° F. The case was rather striking on account of the negative clinical findings; a trace of albumin had been noted on two occasions. She had been treated unsuccessfully with hexamine and salicylates. Her previous history was unimportant. The family history showed a tuberculous taint in the father. Examination revealed a few acne-like spots, a furred tongue, tenderness of the pectoral muscles, and slight dullness of the right base, but no abnormality of breath sounds. In all other ways the result of examination was negative. The blood showed 100 per cent. hæmoglobin; 7400 white cells per c.mm. A differential count showed: jügendlich 1·0 per cent., stabkern 5·6 per cent., segmentkern 68·0 per cent., lymphocytes 20·3 per cent., transitionals 3·9 per cent., eosinophils 0·6 per cent., mast cells 0·6 per cent. The red cells showed no abnormality. The urine gave a hydrogen-ion concentration of 7·4, and contained no albumin, sugar, blood, bile, or indican. The amount of urobilin was 0·02 per cent. Deposit showed a little pus, but no casts or red cells. A film showed a few Gram-positive cocci and culture gave a diphtheroid bacillus, streptococci, and a short Gram-negative bacillus which showed the cultural characteristics of *B. abortus* of Bang.

A specimen of the milk consumed at the house gave a positive culture of *B. abortus*. The patient's serum agglutinated a standard culture of *B. abortus* up to a dilution of 1/10,000; it agglutinated *B. melitensis* to a lesser titre, but the figure in my notes is now illegible. *B. typhosus* was agglutinated to 1/50; *B. paratyphosus* A and B were not agglutinated. Her serum agglutinated the *B. abortus* isolated from her urine up to 1/12,000; it agglutinated the *B. abortus* isolated from the milk in dilutions up to 1/8000.

An autogenous vaccine was prepared and administered, but appeared in no way to influence the pyrexia. Treatment was otherwise symptomatic, and the pyrexia continued. In view of the family history and the exhausting nature of the illness, a watch was kept for pulmonary lesions; late in February, 1927, a cough with sputum appeared and the sputum showed tubercle bacilli. She was transferred to the Nordrach-on-Mendip sanatorium.

It is regretted that further work was not carried out on this case; the excuse is that intensive work on another problem was in progress at that time.

I have to thank Mr. E. Guise, of the Department of Pathology, for help in the isolation and serological investigations of this organism. It may be added that agglutination tests with the serum of a few other cases complaining of "rheumatism" at this time gave completely negative results with two strains of *B. abortus*.

A BACTERIOLOGICAL INVESTIGATION OF THE PRESENT INFLUENZA EPIDEMIC.

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AND
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PATHOLOGIST TO THE LABORATORY.

SEVERAL years ago we began to record systematically by means of extensive microphotography the bacterial flora of the human body.*

Special attention was devoted to the respiratory tract. After taking thousands of photographs it was concluded that the bacterial flora, and more especially the streptococcal flora of the respiratory tract, was enormously complicated, containing over one hundred varieties. The task became so gigantic that we began to realise that unless simpler and more rapid methods of recording could be devised we would never be able to clear up the extraordinary chaotic condition of our knowledge of the subject.

A New System of Investigation.—Fortunately, during the past year we have managed to achieve the simplicity and speed of work. The system we now adopt is to photograph the cultures from the human material on Crowe's chocolate blood-agar medium. This medium we have found is by far the most differential of all culture media. It has an extraordinary power of making the various species of germs show their individuality by the appearance of their colonies. The variety and even beauty of appearance and design of the colonies as seen on the medium through a stereoscopic microscope is very striking. We commenced, therefore, to photograph the cultures on Crowe's medium on an extensive scale. Our methods of taking this type of micro-photograph have continuously improved and have now attained a high degree of perfection and simplicity. During the past eight months we have worked on a definite system as follows:—

1. Cultures are taken from the throat and sputum of one of ourselves every week during the whole year round. The photographic records of these cultures on Crowe's medium are kept in albums and copious notes are taken of the nature of the bacteria found.

2. Photographic records of cultures from the sputum and throats of other members in the laboratory are taken at less frequent intervals.

3. When a cold or feverish attack occurs in any member of the staff frequent cultures are then taken and photographed.

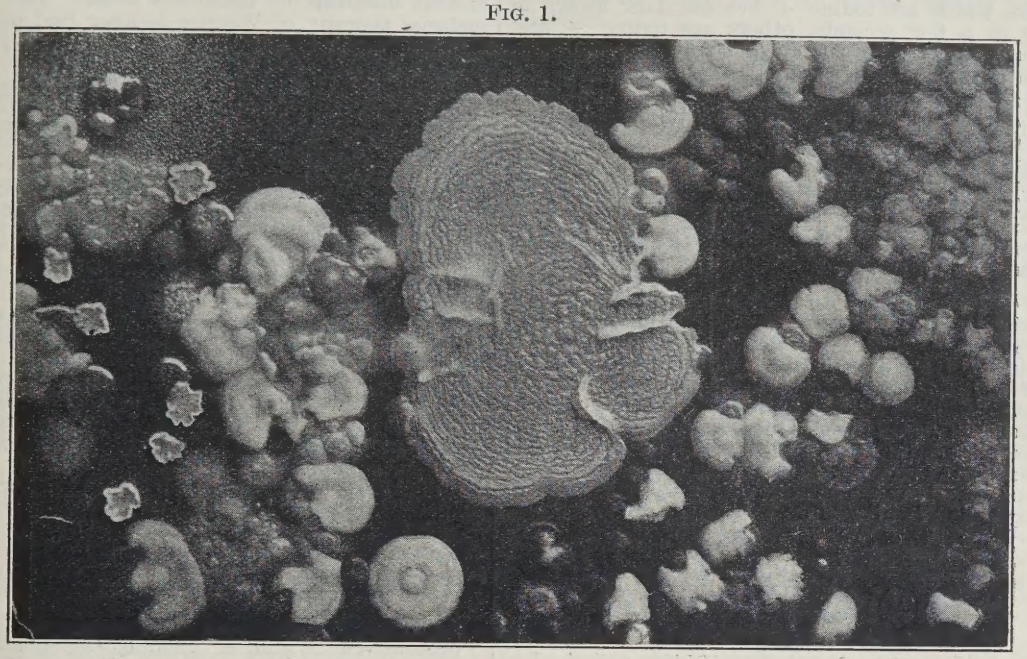
The photographs taken during the period of catarrhal infections are then compared with those taken when the individual was in good health, to see if any new bacterium has arrived in mass, which would account for the catarrhal condition.

Results.—The results obtained by the above method of investigation are very instructive and may be described shortly as follows: 1. The bacterial flora of the respiratory tract is chiefly streptococcal. The streptococci as a rule make up 90 per cent. of the total flora. 2. The streptococcal flora is constantly varying every week, even in health. 3. When a definite catarrh or cold occurs one can as a rule (on investigating the photographs carefully) place one's finger on the suspected organism. 4. Cultures from the nasopharynx or sputum of persons suffering

* These photographs are being published extensively in the Annals of the Pickett-Thomson Research Laboratory. The journal was started chiefly with this purpose in view, as the expense of plates in ordinary publications is prohibitive.

from the influenza of the present epidemic invariably show large numbers of colonies of a definite streptococcus which appears to us to belong to the pneumococcus group. 5. Cultures from persons suffering from sporadic colds previous to the epidemic did not show this pneumococcus-like organism, but other varieties of streptococci were usually incriminated. 6. The organism which is occurring in large numbers in the present epidemic is quite different from the streptococcus described by us as causing the influenzal colds of two years ago. 7. We would suggest, therefore, that so-called influenza epidemics may be due to virulent streptococcal infections of the respiratory tract, and that these streptococcal infections may vary with different epidemics.

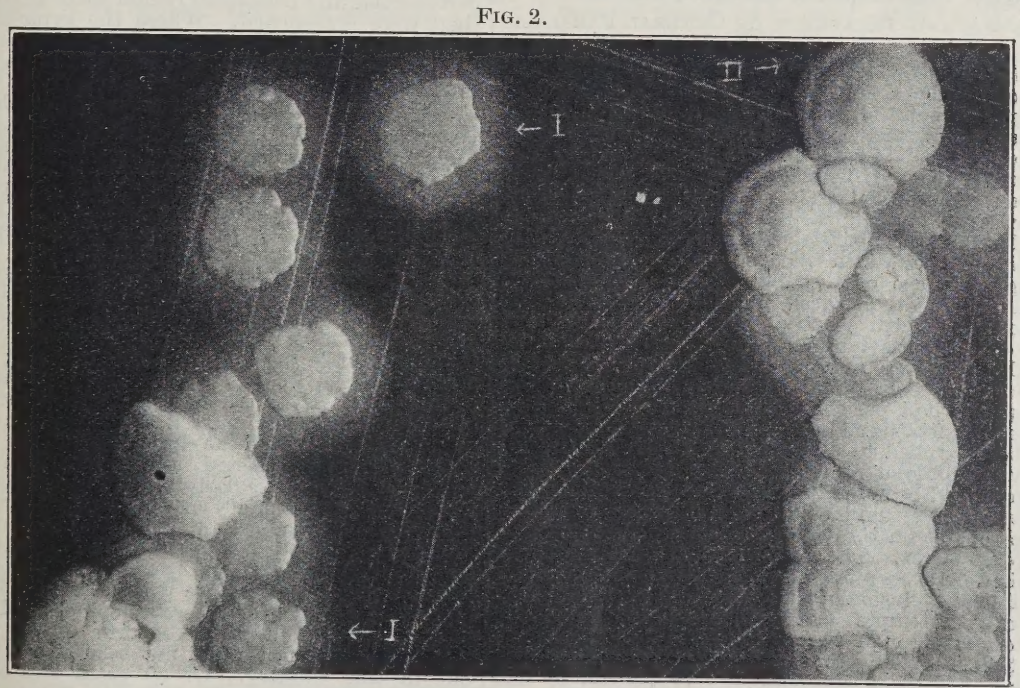
FIG. 1.



Culture on Crowe's medium from throat, September, 1928, before influenza epidemic. The colonies seen on Fig. 2 only appeared constantly in the present epidemic. Figs. 1 and 2 are magnified 16 diameters.

A New Iodine Test.—In the course of our investigations we discovered a rapid new test for the differentiation of the colonies of streptococci and other

FIG. 2.



Culture on Crowe's medium from nasopharynx of case of influenza, January, 1929. I shows type of colony constantly present in large numbers, apparently a species of pneumococcus. The photograph does not show the highly glistening appearance of the colonies, partly because the plate had dried somewhat before the photograph was taken. II is a diphtheroid bacillus.

organisms. This test, which is described in full detail in the Annals of the Pickett-Thomson Research Laboratory, Vol. IV., consists simply of placing a drop of Lugol's solution over the colony. Some colonies which are iodine + become dark brown in colour in a few seconds, others are iodine − and remain unaffected by the Lugol's solution.

The Question of Mutation.—Our observations do not lead us to believe that mutation occurs to any great extent in the streptococcus group of bacteria. They remain extraordinarily true to type in their colony appearances on Crowe's medium. We have photographed over 50 strains of streptococci from the National Collection of Type Cultures (Lister Institute) at intervals of a year, and we find that the colonies remain identical in appearance after continuous subculturing for that period of time.

We did not intend to publish any work on the bacterial flora of the respiratory tract until we had obtained many more records, but we consider it our duty to write the above short note drawing attention to the constant presence of a pneumococcus-like streptococcus in the sufferers from the present epidemic. This organism is bile soluble. The colonies on Crowe's medium are flat, moist, opalescent, and glistening, and surrounded by a wide greenish-yellow zone of bleaching. The illustrations reproduce two photographs of cultures on Crowe's medium.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF PSYCHIATRY AND NEUROLOGY.

A JOINT meeting of these Sections was held on Feb. 12th and 14th. On Feb. 12th the chair was taken by Sir MAURICE CRAIG, President of the Section of Psychiatry, and on Feb. 14th by Mr. DONALD ARMOUR, President of the Section of Neurology. The subject of discussion was the

PROGNOSIS AND TREATMENT OF GENERAL PARALYSIS OF THE INSANE.

Dr. W. H. B. STODDART said that formerly it had been generally agreed that a diagnosis of general paralysis meant 100 per cent. incurability and death within a few years. Natural remissions were known to occur, but information was lacking as to the percentage of cases in which they took place. The London County mental hospitals reported that 2·6 per cent. of their cases had improved before the introduction of malarial therapy. Dr. Stoddart himself had obtained 25 per cent. of remissions through the use of hexamine, given with brandy, and 17 per cent. of these had not relapsed. Other methods for which curative value had been claimed were either antisyphilitic or pyrexial. The usual specific drugs were of no avail because they could not enter the cerebro-spinal fluid. Injection into the lumbar sac had proved too dangerous. Marinesco's method of intrathecal injection of salvarsanised serum had been applied to paralytics by G. M. Robertson, and very different reports had been received. Many attempts had been made to introduce salvarsanised or mercurialised serum into the subdural space or lateral ventricle, but on the whole clinical amelioration had been but slight. The cerebro-spinal fluid might be modified or even rendered normal, but the effect on the clinical evolution of the disease was very doubtful. Recently, attempts had been made to introduce substances through the occipito-atlantoid ligament, but this was dangerous and unnecessary, and the method had been discredited. Tryparsamide had been introduced in America for neurosyphilis, and varying views were held about its value in general paralysis. There was a risk of optic atrophy in 4 or 5 per cent.

The value of pyrexia had been known for many years; in 1848 there had been a discussion of the favourable effect of malaria on insanity, and physicians of the time had discussed the advisability of removing mental hospitals to malarious areas. The induced malarial therapy of Wagner-Jauregg had been tried in a number of hospitals in London and 33 per cent of the cases had been discharged much improved, the figure rising to 60 per cent. if only recent cases were included. Even if no remission took place there was marked improvement in the general condition, and subsequent salvarsan treatment reduced the mortality from 32 to 6 per cent. Viennese workers claimed 83 per cent. of remissions with return to work. There seemed no choice between the use of mosquitoes and of malarial blood. Some patients would not take malaria properly, and for these all ways of inducing pyrexia had been tried: streptococcal, staphylococcal, typhoid, rat-bite fever, *Bacillus pyocyaneus* or *proteus* and tuberculous vaccines, and the subcutaneous injection of sodium nucleinate, proteins, milk, and other substances. With almost any form of treatment remissions could be obtained in about 20 per cent. but the rate was very much higher with malaria, and this must be regarded as the treatment par excellence. The contra-indication was any poor general condition such as advanced age, heart or kidney disease, tuberculosis or intercurrent malady, or undue tendency to paralytic wasting. Often the cerebro-spinal fluid was found to be normal some months after malarial treatment, but no importance was to be attached to a treatment that produced a normal cerebro-spinal fluid without any clinical effect.

Sir JAMES PURVES-STEWART suggested the name "progressive syphilitic meningo-encephalitis" to clarify our conception of the condition. There were two types of syphilitic encephalitis, he said: Interstitial, which was amenable to antisyphilitic remedies, and parenchymatous, accompanied by toxic and later by degenerative changes in the nerve-cells. The consensus of medical experience showed that in the second form the most assiduous course of anti-syphilitic drug treatment usually failed to arrest the progress of the disease. This was because the drugs failed to reach the diseased nerve-cells owing to the perivascular and perineural lymph space behind which they were entrenched. Where the syphilitic toxin could get it was reasonable to expect the antitoxin to go; at present, however, the biochemist had not yet produced this substance. Sooner or later it would be isolated and would prove as valuable as diphtheria antitoxin. More modern methods attempted to prevent neurosyphilis by stamping out the disease in its early stages—despite the claim recently made by a Norwegian investigator that early treatment failed to cure the original disease and diverted it to unnatural channels, thus actually producing neuro-syphilis. True specific treatment had not yet been found, as shown by the fact that the serological reactions often remained positive; so long as this was the case no one was justified in claiming "cure." The early preparalytic group was the most hopeful; there was little justification for submitting to treatment patients in whom cortical degeneration had commenced. Pyrexial treatments—of which benign tertian malaria had proved the most convenient—undoubtedly modified the clinical symptoms, but some patients were unaffected, and the method was not devoid of risk, particularly from cardiac failure. The reason for the diversity of opinion on its value was the varying standard of so-called recovery, which might mean simply transfer to care of friends or might ignore serological findings. Sir James Purves-Stewart had not met a single case where malarial treatment alone had brought the cerebro-spinal fluid back to normal. The optimistic reports of tryparsamide treatment in America had not been altogether borne out in this country. Of 20 cases treated at the Maudsley Hospital by W. S. Dawson two had died, 13 had shown clinical improvement, and seven serological improvement, but only in two had the Wassermann reaction become negative in the cerebro-spinal fluid.

In no case was any result obtained that might not have been obtained by the administration of other compounds. The best method was simple intravenous administration of 1 to 3 g. weekly, perhaps for a year, followed up by a course of bismuth, arsenic, or mercury.

Intracisternal Injection of Salvarsanised Serum.

Sir James Purves-Stewart said that salvarsanised serum compared very favourably with the other two methods of treatment, and presented detailed tabulated reports of 24 private patients treated by intracisternal injection, a technique that was not difficult when once mastered. He had always followed up malarial or any other form of treatment by a course of injections of autogenous salvarsanised serum, given fortnightly for six or eight fortnights. Usually the patient showed no reaction—at most a mild pyrexia. Antisyphilitic treatment was given in the intervals and the results were carefully checked by serological examinations of the blood and cerebro-spinal fluid. The amount of salvarsan present in the serum must be extremely small; the effects were perhaps due to antibodies or to protein shock. If the serum were put into the lumbar region, very little of it reached the ventricles. Serological without clinical improvement might be obtained from the use of this method alone, but the best results came from malarial therapy followed by injection. Whatever method was used, the standard of recovery should include serological reactions in the blood and cerebro-spinal fluid as well as clinical remission.

Erroneous Diagnoses due to Serological Examinations.

Dr. JOHN BRANDER said that serological examinations had introduced into the diagnosis of general paralysis an added source of confusion, and there had been a tendency for some years to include neurological and mixed types merely on the basis of serology. These latter used to be called "insanity with gross brain lesion"; they usually responded to treatment, and their prognosis was much less grave than that of general paralysis. The relative proportions of the two groups in any given series might produce very varying results. Routine examinations had shown that many conditions other than general paralysis might present a similar serological picture, and errors in diagnosis were much more frequent than was supposed. For instance, a maniacal case of dementia præcox had been admitted to hospital 19 years ago; later he had been diagnosed on serological findings as general paralysis. Without any treatment the patient was still alive and well, and still a dementia præcox, though now with a normal cerebro-spinal fluid. Dr. Brander's experience gave no support to the theory that general paralysis was changing its nature. Instead of assuming a change of type, we should guard against change of diagnostic standards.

He had examined two series of records of paratics at Bexley Heath, before and after malarial treatment respectively—i.e., in the years 1910–14 and 1920–24 when malaria had been given to all who were not too exhausted for it. On the whole the expansive types did best and the tabo-paretic and stuporose worst, but the type of case did not seem to have much influence on the prognosis. Sometimes later cases did better than apparently early ones. There was no association between the duration or severity of the malaria and the results. Of those followed up, 0 per cent. showed a decrease of the Wassermann reaction in the cerebro-spinal fluid, while 10 per cent. showed increase. Twice the fluid had become entirely normal. The gold curve and the protein content had improved in 70 per cent. and the cell-content was diminished in all. The Wassermann reaction in the blood had decreased in 50 per cent. and increased in 1 per cent.; it had become negative in one patient. Of the 19 cases remaining in hospital 15 showed marked diminution of previously gross changes in the cerebro-spinal fluid, five had a negative Wassermann reaction in the fluid, and four a negative gold curve. There was no apparent relation between these changes and clinical progress. Malaria alone seemed able in many cases to establish a gradual elimination of the virus of syphilitic encephalitis, but if the disease-process had attained a certain degree of severity the patient might continue to manifest progressive symptoms which were not of an actively syphilitic nature.

Dr. E. D. MACNAMARA said that induced malaria offered more hope of amelioration than any other form of treatment, especially if some form of anti-syphilitic therapy were given as well. Relapsing fever and antichancroid vaccine were said by some workers to be less dangerous than malaria. The spirochæte had been found in the cortex of patients who had had malarial treatment. Natural malaria before or after syphilis did not modify the latent period between infection and the appearance of general paralysis. The early stage might last for years and be improved by any kind of treatment, including the lapse of time. It was questionable whether this stage was really an early stage of general paralysis or only a meningovascular disease which might never become paralysis. Serological changes in the cerebro-spinal fluid did not always herald general paralysis or tabes. The recovery-rate now was much the same as it had been in the first third of the last century; possibly it was high because we now included many cases which were not really general paralysis at all.

Major F. H. STEWART described a modification of malarial treatment which gave equally good results with less danger and suffering to the patient. The infection, induced by 6–10 c.cm. of malarial blood, was stopped with quinine after one or two rigors and active tryparsamide treatment was instituted. The patient was reinoculated at intervals of two months until he recovered or appeared hopeless. The aborted fever was usually sufficient to restore ability to work or to return home. The later malarial attacks tended to die out spontaneously.

Dr. G. DE M. RUDOLF pointed out the difficulty of saying that a paralytic had "recovered," as untreated cases had been known to have remissions extending over many years. The only "recovery" was a good remission lasting to the average age of death; return to clinical or serological normality did not signify recovery. He then related the findings of the committee appointed in 1925 to report on the value of malarial treatment in the London County mental hospitals. Of 227 patients not treated with malaria 2·6 per cent. had been discharged; of 191 treated with malaria 33·5 per cent. had been discharged. Of 191 unselected cases at Claybury 31·4 per cent. had been discharged. Of 89 who had had malarial treatment alone 37·1 per cent. had been discharged; of 28 who had had malaria and sulfarsenol 59·6 per cent., and of 14 who had had malaria, mercury, iodide, sulfarsenol, and tryparsamide 37·5 per cent.

Dr. C. C. WORSTER-DROUGHT described his experience of malaria followed by intravenous novarsenobillon at a neurological hospital. The diagnosis had been based on clinical condition, a positive Wassermann reaction in the blood, and cerebro-spinal fluid and a paretic type of Lange gold curve. Of 35 cases treated in 1923–24 20 per cent. were now at work, 50 per cent. were improved but could scarcely be called useful members of society, 20 per cent. were in mental hospitals or dead, and 10 per cent. had not been traced. There was a perplexing difference between these results and those reported from Vienna. The Wassermann reaction had become negative in a large proportion, but not until after two years. The somatic type with predominating physical symptoms had an infinitely better prognosis than the mental type. Blood-transmitted infection was preferable because the rigors developed more rapidly and seemed to be less exhausting and because they were more easily controlled.

Experience with Relapsing Fever, Saprovitan, and Milk.

Dr. A. A. W. PETRIE described the reaction of patients to relapsing fever; three or four pyrexial periods usually occurred, but the only sequela had been temporary Bell's palsy in four cases. Seven patients had been

discharged, five had shown improvement, nine had been unchanged, two had become worse, and three had died. At times inoculation with relapsing fever might prove dangerous and difficult to control. Of 11 patients injected with saprovitan only one had shown real improvement, although reliable pyrexia had been produced. Milk injection had given little result, and the pyrexia produced by this method seemed to depend upon the presence of organisms in incompletely sterilised fluid and not upon a true protein reaction.

The Board of Control Investigation.

Surgeon Rear-Admiral E. T. MEAGHER described the investigation he had made for the Board of Control into the results of malarial treatment in the 41 mental hospitals which had used it, compared with the results of other treatments in the 97 other hospitals. All the cases had been followed up and those discharged had been personally visited by himself. In the two years 1923–24 there had been 1173 direct admissions of general paralytics; of those not treated by malaria 87 per cent. were dead, 10 per cent. remained in hospital, and 3·4 per cent. had been discharged. These figures, therefore, constituted a standard by which to measure the results of malarial treatment. Of the 438 patients treated with malaria up to the end of 1924 43·6 per cent. were dead, 31·7 per cent. were still in hospital, and 24·7 per cent. had been discharged. Even in the best of all the non-malaria hospitals the percentage of dead was 65. The same superiority of malarial treatment was revealed whatever tests were applied to the figures. The patients remaining in hospital lived more natural lives and were in a better state up to the time of their death. Of the 134 discharged 108 remained discharged, so that only one in five of them might be said to have "failed." Of the cases not treated with malaria one-half failed. Seventy-seven were following their former avocation, 10 were degenerating, and 11 had not been traced. The recovered ones all showed a surprisingly high standard of neatness in dress, of insight, judgment, and memory, and expressed anxiety as to the future. Their speech was normal and they had no tremor, though many looked as if they had been through a severe illness and were more tired than before. Of the total of 1597 patients treated with malaria in the quinquennium 1922–27 34 per cent. had died, 41 per cent. remained in hospital, and 25 per cent. had been discharged. Of those who had died one-quarter had died within a month of malarial inoculation, and this process certainly seemed to precipitate death in many cases, although Wagner-Jauregg claimed that he had eliminated early fatalities by the routine use of cardiac stimulants at the onset of each febrile attack. There was evidence on all hands that malarial treatment required reinforcement; all the continental clinics were using arsenic in some form as well. The result of the inquiry might be summarised: malarial therapy is of value in extending life, in improving the mental and physical state of the patient, and in allowing 20 per cent. of cases to resume normal life; it appears to be the best form of treatment at present known.

The Use of Tryparsamide.

Dr. THOMAS TENNENT said that tryparsamide had first been used for neurosyphilis in 1923. Since Dawson's work 33 more cases had been treated at the Maudsley Hospital by 12 weekly injections of 3 g. Malaria was used as well and the tryparsamide was continued throughout the fever. There was no evidence of cumulative effect. Treatment could be continued for two or three years if the serological tests remained positive. Remissions had been obtained in 32 per cent. of cases, and these patients had been living normal lives for one to four years. The chances of improvement definitely diminished with delay in initiating treatment. Many patients showed clinical improvement without serological changes, but all of them had a reduction in the cell content; the Wassermann reaction and globulin came next in order of improvement and the gold reaction was the most resistant. The Wassermann reaction remained positive in the blood more often than in the cerebro-spinal fluid. It was impossible to say at what point serological improvement would take place, and there was no parallelism between serological and clinical improvement except that in the later stages all patients who improved physically also showed serological changes. The converse, however, was not true. Two cases of amblyopia had occurred, but had improved when the treatment was interrupted. Tryparsamide was a valuable drug, but was best combined with pyrexial treatment.

Dr. J. G. GREENFIELD said that most of the malaria-treated paralytic patients who came to post mortem at Queen-square had died from lung complications. The chief changes in the brain were enormous excess of small round-celled infiltration, in which the leucocytes exceeded the plasma cells. In later stages early, or even gross, gummatous change might be seen. There was a rapid and most striking disappearance of spirochætes. It was not surprising that this acute encephalitis with malaria infection caused a great tendency to death from intercurrent infection. It explained the necessity of reinforcing malarial treatment by salvarsan. The changes in the cerebro-spinal fluid were more evidences of "scarring," of the process of clearing up the inflammation, than of continued active infection.

Dr. DAVID NABARRO said that the cerebro-spinal fluid of every syphilitic should be examined at the onset of treatment and at the time of discharge. Evidence of central nervous system involvement was often seen at Great Ormond-street in the form of fits, spasticity, or mental deterioration. If the Wassermann reaction were positive in blood and fluid and the gold curve were paretic, the child was then regarded as a probable paralytic. Cisternal puncture had been done on a number of children and was not difficult. He described the treatment of several children, particularly one reported in THE LANCET [1] who was still well and progressing. Malaria had been given to four or five general paralytics without marked benefit. Intracisternal puncture had proved much more satisfactory, but the best treatment was to forestall neurosyphilis altogether.

The Present Wagner-Jauregg Technique.

Dr. HANS DEUTSCH (St. Louis) described the method employed at Vienna, as differences in technique might account for varying results. The malaria was always inoculated from patient to patient; after several passages the disease was no longer transmissible to mosquitoes and became extremely sensitive to quinine. Three half-grain doses would stop the rigors. If the patient did not react to subcutaneous inoculation, 5–10 c.cm. were given intravenously. If this produced no result, mixed typhoid vaccine—about 25 million—was given, and this usually produced a pyrexia on which malarial rigors supervened. The number of rigors was usually 8–12, but the patient's condition might make it necessary to interrupt the treatment and resume it after a few months' rest. This reduced the mortality-rate, especially in elderly patients, and the only difference in the second inoculation was that it usually produced a rigor without the help of TAB. Digitalis was given to every patient and six salvarsan injections were always administered. Malarial therapy was not a substitute but an aid to specific treatment in syphilis. Malaria was never given alone. A second course, a year or more after the first, was beneficial and prolonged the remission. Patients reported regularly for serological and mental tests. If no rigors could be obtained with malaria relapsing fever was given and followed by salvarsan. The spirochæte was a mesoderm organism which could only enter the ectoderm when the glia had been broken down. The benefit of the treatment lay in stimulating the ectodermal defence preventing the spirochæte from entering the cortex and limiting it to the perivascular space when

[1] THE LANCET, 1927, ii., 692.

alvarsan could get at it. It was not allowable to peak of "cure" but merely of "remission," for ervous tissue could never regenerate.

The Concept of Neurosyphilis.

Dr. GLEN DUNCAN observed that an "early" case vas not necessarily one which had only had mental ymptoms for a brief period; the severity and apidity were of greater prognostic significance. The ental hospital could not continue treatment up to ecovery; it was bound by law to discharge patients s soon as they were fit for liberty. It was for the eurological hospital and general practitioner to see hat treatment was continued, and there should be loser coöperation for this purpose. There was in sychiatry a great tendency for treatment to be ampered by stock diagnoses. Neurosyphilis could asily be diagnosed, but there was a definite proportion f cases which could not certainly be labelled as general aralysis. If—as the discussion had suggested—here was no such pathological entity as general aralysis, then much less was there any such clinical ntity. Could we not take our stand solely on the oncept of neurosyphilis, asking: Is this patient ikely to be improved by drug treatment alone, and, f not, proceed to other forms of therapy, including nduced pyrexia. Practical application of this oncept of neurosyphilis did not exist in mental ospitals.

Dr. W. D. NICOL said that advanced cases should lso be given the benefit of treatment. Obese patients eacted badly to malaria. A small dose of quinine—.g., grs. 5 by the mouth—during treatment was one f the most important factors in lowering the death-ate. It caused a remission of 14–18 days during which he patient recovered from the strain and then started is malaria again with less severe rigors. Failure of he temperature to reach normal was a warning that omething was going wrong. Mosquitoes had been ised exclusively at Horton, and cases tended to elapse six or seven months after the febrile attack. The fact that mosquito results were 10 per cent. better han blood cases was perhaps due to this relapse, ndicating some continuous process. Experiments vere being made with a quartan strain which gave ess severe rigors and a two-day rest interval. Patients olerated quartan fever very well, and Kirschbaum in Hamburg had reported 50 per cent. of remissions from ts use. It would be useful for patients who did not mprove with benign tertian or would not reinfect vith it. About half the manic, one-third of the lepressed, and 12 per cent. of the grandiose patients vould have remissions.

Dr. KUBIE (New York) emphasised the difficulty f selecting true cases of general paralysis out of ll those in which the nervous system was involved. Even with positive serology a certain diagnosis could ot be made in the absence of intellectual defect. Those who had mental defect must be divided into the lelirious and the progressively deteriorating non-lelirious. The state of the former was not always a lorid hallucinatory delirium; there were all gradations etween that and the slow type. True deterioration vas only reached as the result of a long, slow, rogressive cortical destruction, but many neuro-yphilitics who were not paretics, as well as many aretics who were not degenerated, would show elirious episodes in which the signs of deterioration vere closely simulated. The action of the arsenicals vas a mystery, seeing that they were almost non-iffusible substances put into the blood stream, which vas binding them to its proteins and getting rid of hem in every possible way all the time. By the ime an injection was finished a great deal of the dose ad already left the blood stream. Their undoubted iological value was a pure empiricism; it was just s logical to use plain serum as salvarsanised.

Replies.

Dr. STODDART, summarising the discussion, said hat of all the treatments devised for general paralysis alaria had the best record. There was also a onsensus of opinion that some reinforcement was necessary. There might be rather more erroneous diagnosis than was usually recognised, due perhaps to attaching too much importance to serological tests. He suggested the use of malarial therapy followed by hexamine, and withdrew his statement that intracisternal puncture was dangerous and unsatisfactory.

Sir JAMES PURVES-STEWART spoke of the extraordinary unanimity that had been shown on the value of pyrexial treatment, and of malaria in particular. Diagnosis must be based on clinical and serological grounds and on neither alone. The extent of recovery possible in any individual case did not depend on the treatment, but on the amount of anatomical survival of brain structures at the commencement of the treatment. The patient must be treated before degeneration had set in.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

AT a meeting of this Section on Feb. 15th, Dr. J. S. FAIRBAIRN, the President, being in the chair, Prof. JAMES HEYMAN (Stockholm) read a paper on

EXPERIENCES OF RADIOLOGICAL TREATMENT IN GYNÆCOLOGY.

Cancer of the uterus, he said, belonged to the category of carcinomata that could be cured—i.e., for five years or more—by radiotherapy. The treatment brought about a healing process characterised by selective destruction of the tumour cells and plastic regeneration of the tissues. In most cases a moderate atrophy of the uterus and vagina remained. Failure to cure might result from many factors—too large or too small doses, unsuitable intervals, unsuitable filtration, or inferior technique. Unskilful treatment might cause severe damage and suffering to the patient, including necrosis, sloughing, and fistulæ, and the effects—good or ill—of radium only became apparent after a long latent period, perhaps of several years. The early workers had not known how to avoid the dangers, and the damage they had inflicted had done much to discredit radiotherapy. Thanks to the wise and cautious pioneer work of G. Forssell, Sweden had been particularly fortunate. Forssell had at first treated only inoperable tumours, but when undoubted results had been obtained and the technique established, he had begun with borderline cases, and had finally gone on to operable cases, when the radiological results had proved as satisfactory as the surgical. Very few operations for extensive cancer of the cervix were now performed in Sweden. Nevertheless, between 1914 and 1923 the inoperable and borderline cases treated had been 74·5 per cent. of the total, and it was almost entirely on the inoperable case that the Stockholm technique had been elaborated. Several patients treated during 1914 and 1915 were still alive.

Cancer of the Cervix.

Between 1914 and 1923 Radiumhemmet had treated 737 cases of carcinoma of the cervix, this series including every case, even those who had only had a single palliative application or who had interrupted their treatment before it was finished, but excluding prophylactic treatments before operation. All the patients had been under observation for at least five years, and the diagnosis had been histological in almost every case. Every patient had been followed up, and the Government had paid the travelling expenses of poor persons to Radiumhemmet. Of the 737 patients, 170 were alive and well five years after treatment—i.e., 23·1 per cent. Deducting cases subsequently operated on and adding some which had been too hopeless for treatment, the net five-year cure figure for all cases came to 20·6 per cent. There had been a primary mortality of 2·1 per cent. Of the 188 operable cases treated, 76, or 40·4 per cent., had been cured for five years. The figure for inoperable and borderline cases was 16 per cent., or 13 per cent. for inoperable cases alone.

The radium salt was enclosed in Dominici tubes and special applicators of many different shapes and sizes. The governing principle of treatment was a

small number of relatively heavy doses in a relatively short time, adjusted with reference to the reaction of the patient. Three applications were given in a month, with intervals of one week between the first and second, and of two weeks between the second and third. Each application lasted from 19 to 23 hours and was given through a 3 mm. lead filter within the uterus, as well as in the vagina, if possible. Every effort was made to cover the whole surface of the tumour and to get as close as possible to the pelvic walls by expanding the vagina laterally. The application varied considerably in different cases, the applicators and tubes being selected in accordance with the size and appearance of the tumour and the general condition and complications. The method was certainly simpler than a Wertheim's operation, but called for far more than mere possession of radium and theoretical knowledge. An inexperienced operator had brought down the percentage of cures at Radiumhemmet in 1916–17, and reports from different clinics varied considerably for similar reasons. Intubation of radium needles had been introduced recently, and attempts had been made to concentrate the treatment into two applications. In 1919–22 a combined treatment of radium and X rays had been tried, and this seemed to be of value in certain cases. Percutaneous treatment at a distance had shown remarkable primary results but required at least 2 g. of radium.

Cancer of the Body of the Uterus.

Forty-six cases of cancer of the body had been treated between 1913 and 1921; the 54·3 per cent. of these which had been operable were divisible into the clinically operable and the technically operable. The latter included cases where operation was unsuitable on account of complications in other organs, old age, or adiposity; they accounted for 34·8 per cent. The five-year result for all cases was 43·5 per cent. cured, and for the operable cases 60 per cent. Owing to the difficulty of obtaining microscopical diagnosis in these body cancers the figures might prove less accurate than those for the cervix. The technique was much the same as that for cancer of the cervix, but the vaginal dose was limited to two-thirds of that usually given for cervical carcinoma—i.e., about 3000 mg. e. hrs. The patient should be operated on if, two months after radium treatment, she still had discharge or hæmorrhage, or if signs of recurrence, such as pyometra, appeared later. Local radium treatment could be repeated if operation were impossible, apparently with less risk than that attending repeated vaginal treatments.

Carcinoma of the Ovaries.

The ovarian series was small and classification difficult, so that statistics of value could not be prepared. Radiological treatment alone would not yield lasting results; it must be combined with surgery. An inoperable case was first treated by X rays, the abdomen being divided into fields of about 10 by 10 cm. The dose and intervals had to be carefully adjusted to the general condition, and a leucopenia or a relative lymphopenia was an indication for decreasing the dose or increasing the interval. The initial dose was usually one-tenth or one-eighth of a skin erythema dose on one of the fields with a 0·5 mm. copper filter and 40–50 cm. skin focus distance. If all went well the dose was slowly increased to a sixth, a quarter, and a third, until a total quantity of about one skin erythema dose had been given to each field. If the tumour became small and movable, operation was performed about four weeks after the last treatment, when the effect of radiation was at a maximum. After operation X rays were continued and radium was applied as well, usually one intra-uterine application for 30 hours—about 1500 mg. e. hrs. Often it was wise to be content with palliative doses only, as attempts to remove the growth caused a worse general condition than before. Prophylactic treatment consisted in one intra-uterine radium application and a series of X ray treatments from one posterior and two anterior fields.

The conclusion was that radium alone was satisfactory in cancer of the cervix, but not elsewhere. Carcinoma of the vulva required combined treatment with electro-endothermy, X rays, and radium, local and distant. Myomata were treated almost entirely by X rays. It was of the utmost importance that treatment of gynæcological cases should be in the hands of a gynæcologist trained in radiology, who should have at his disposal an independent department equipped with every technical resource, specially trained assistants, and a follow-up organisation. The results obtained at Radiumhemmet were to be ascribed above all to the fact that the treatment of gynæcological cases had been attached to a radiotherapeutic clinic.

The Technique Used at St. Bartholomew's Hospital.

Dr. MALCOLM DONALDSON described the development of radiotherapy at St. Bartholomew's, and said that improved results had been obtained by using smaller quantities of radium for a longer time. In carcinoma of the vulva, for instance, 10 mg. in a dozen or more needles spread over 25 sq. cm. for three weeks had given the best results. Needles were used instead of plaque applicators because they gave a more uniform irradiation. The statistics from the small series so far treated were not as good as those from Stockholm, but the method had not yet been adequately tested.

The patient's vagina and cervix were cleaned up by douches for a few days, and under the anæsthetic was swabbed with picric acid. In every case a small piece of growth was removed for microscopy, and 50 mg. of radium inserted. Sixteen small needles each containing 2 mg. and with an active length of 3·2 cm., were placed around and sometimes in the growth, and six larger ones, containing 3 mg. each and with an active length of 4·8 cm., were put in the fornices to radiate upwards and outwards into the base of the broad ligaments. The vagina was then packed with gauze soaked in 1/4000 flavine and left for 144 hours. The cervix and vagina practically always healed in six or eight weeks, but late results were less satisfactory. The total dose seemed to have little to do with survival-rate, but the time factor was very important in the more resistant growths, though less so in the quickly growing ones. A number of other factors might be important but had not yet been investigated; these included the type of cell, the splitting of the dose, and the possibility of greater radio-resistance in the depths of the tumour and of "cancer-resistance" in the patient. Probably the most important factor was the advancing edge of the growth, which was very difficult to destroy entirely. This might be attacked by X rays or by intra-abdominal radium. Investigations were being made into the effect of inserting needles through the parietal peritoneum all round the pelvis at intervals of 1·5 cm., leaving them sutured to the peritoneum for a week. Fourteen cases had been thus treated. Happily the day for convincing people that radiotherapy had value was now past, and discussion centred only on the best method of applying it. The St. Bartholomew's technique was shaped with the idea of finding out the principle underlying the vulnerability of the individual cell and of applying that principle to the advancing edge of the growth.

The Use of X Rays, with or without Radium.

Dr. P. I. LEVITT described the application of X rays and of X rays plus radium to carcinoma of the cervix. Of cases treated between 1924 and 1927 with X rays alone only one was alive, but of eight treated by the combined method three were alive and well, while five out of six treated for cancer of the body of the uterus were alive, four without recurrence. Recurrences after radium were exceptional and were peripheral, just outside the zone of power; perhaps they would be less frequent if the radium were preceded by X rays. An interval of six weeks was left between the X ray and the radium to allow of maximum shrinkage of the tumour.

Neither radium nor X rays could replace the other, but they were admirably suited for combination.

Mr. COMYNS BERKELEY asked a number of questions (see Prof. Heyman's reply) and exhibited a diagram and photograph prepared by Dr. Russ to show the area irradiated by intra-uterine and vaginal applications of radium, and suggesting that it was a mistake to use two tubes in the uterine applicator.

Mr. VICTOR BONNEY spoke of the enormous difference of opinion on what was "operable," and questioned Prof. Heyman's classification of inoperability in many cases. It was impossible to tell per vaginam whether glands and thickenings were malignant or not. The standard of operability in a radiological clinic was far lower than in a surgical one. He himself had operated on 63 per cent. of all the cases he had seen. Radiologists usually failed to state their radiation-rate, leaving it to be assumed that they irradiated every case. He asked the effect of radium on the regional glands, which were carcinomatous in 40 per cent. of cases. The radiologist was running the surgeon very close but had not caught him up yet.

Mr. HERBERT SPENCER said he had used radium for 12 years—long enough to regret some of the Wertheims he had previously performed. He asked Prof. Heyman how he protected the rectum, and mentioned two patients with cancer of the body and secondaries in the vulva and vagina, who had been treated by hysterectomy, X rays, and radium and were well ten years later.

Mr. STANLEY DODD described results in 75 inoperable cases treated with radium in the last four or five years. The greatest success had been attained with a small initial dose, increased after an interval, and the spreading epitheliomatous type reacted better than the hard crateriform intracervical growths. The cervix had been needled with 30–45 mg. for a week, and three weeks later the glands had been removed from the abdomen and radium applied inside if necessary. Irremovable glands could be treated by needling or by tying in a catheter through a stab wound.

Mr. SIDNEY FORSDIKE asked if radium in the vagina would affect iliac glands.

Dr. V. B. GREEN-ARMYTAGE described a recent tour on the Continent. In Berlin pan-hysterectomies were still performed, and they would have nothing to do with radium and X rays, but elsewhere Wertheims had been abandoned and the Stockholm technique was followed.

Prof. Heyman's Reply.

Prof. HEYMAN, in reply to Mr. Comyns Berkeley, said that combined treatment with X rays and radium had been started in 1919 and abandoned in 1922 because the results had not seemed good, but a longer series was wanted, and another had been started. An X ray application between two doses of radium seemed to give better results. The main difference between the Paris technique and the Stockholm was that the Parisian workers gave a concentrated treatment for five days, whereas Stockholm gave three applications in a month. Their total dose could not be compared with his, but the results came very near. Paris and Stockholm were the only clinics that used heavy filtration. The use of 3 mm. of lead was quite empirical, but because all their dosage was calculated on that thickness of filter and the results were satisfactory they continued to use it. The 1916–17 results were inferior, because in those years more patients had been admitted than could be dealt with properly and too small doses had been given. There was nothing more dangerous than to take bits off a tumour during radiological treatment; for that reason the tumour mass was never removed manually, and it disappeared quite as well without this aid. He did not agree with the Parisian classification of tumours into endo- and ecto-cervical or with the view that the former could not be treated radiologically. He had tried taking a plastic (or dental wax) impression of the tumour and embedding the needles in it, but found that by the time two lead sheets had been placed between the mass and the growth he might as well have applicators; also the upper part of the mass was almost too large to get in and out of the vagina. Radiology was a specialty of its own, and the question of specialisation was most important. It should have its own clinic, and every representative of other specialties on its staff should be radiologically trained—which in Sweden meant three years' special work.

Replying to other questions, Prof. Heyman said he did not remove the uterus because he could not approach a growth through a short, sensitive vagina. Every method had its value, and everyone must work on his own lines for five years, then observe for five years, and then begin to discuss values. He had used needles in special cases, but had found long needles come dangerously close to big vessels and ureters. He did not agree that local recurrence was rare after radium. The only way to compare statistics was to give figures of absolute—i.e., five-year—cure. The rectum was protected by the dose, the filter, the applicator, and the method of application, and also by plugging the posterior part of the vagina well with gauze to ensure proper distance between radium and rectum. In a series of 200 cases he had seemed to get the same result with two applications as with three, but he could not recommend this until he had observed a much greater number.

SECTION OF BALNEOLOGY.

AT a meeting of this Section held on Feb. 14th, Dr. KERR PRINGLE, the President, took the chair, and a discussion was opened by Dr. R. G. GORDON on

OSTEO-ARTHRITIS.

The condition, he said, was not a clear clinical entity; it had no clear pathology which was known; in fact, there was little that was clear about it. It should mean an inflammation of the bones and joints, and this, he submitted, was a misnomer. The conditions classed under this title were not directly the results of inflammation, but were degenerative processes. The primary process was a wasting of bone-tissue, followed by a secondary attempt at repair of the destruction by throwing out new bone of irregular structure. There might be two factors, acting reciprocally—namely, damage to the joint, and inadequate blood- or lymph-supply. Osteo-arthritic changes tended to start at the central part of the cartilage, which was the least nourished part of the joint; often patients were able to give a history of injury or strain. Hip-joint disease was common among hunting men who were often in the saddle. A very small proportion of hips the seat of this condition appeared to have been the sites of any congenital abnormality. Coxa plana in the child caused very few symptoms. Thirty-four out of 100 cases showed an architecture of the joint suggestive of old and mild coxa plana. Conditions of defective structure in the child might well form the basis in later life of osteo-arthritis in that joint following strain. Flat-foot was another of the effects of strain. And it was found that bones bearing a large proportional weight showed lines of stress, as in blacksmiths' elbows and miners' shoulders. In the attempts at repair, Nature threw out more bone than was actually required; hence osteophytic outgrowths and increased density of bones. The villous arthritis which accompanied the changes met with in middle life, dependent on metabolic changes, led to osteo-arthritis if the process was not arrested. Pain was a very valuable symptom, but the extent of changes sometimes revealed by X rays, when but little pain was complained of, was surprising. The cartilaginous covering of joints was more sensitive to pain than were bony structures, but there was a relationship between the nutrition, the pain, and the sensitiveness of the joint. Charcot's joint in tabes and syringomyelia he looked upon as osteo-arthritis occurring in an insensitive joint—one which had been progressively disorganised by excessive exercise.

Treatment must be directed to preventing strain and to improving the nutrition of the joint. For avoiding strain well-fitting splints were most useful, as, for instance, the calliper splint. If infection was not the direct cause of osteo-arthritis, it could not be expected that the removal of septic foci or the administration of vaccines would have the same influence as in conditions owning infection as a cause, though for a time vaccines might result in an improvement of the general health. Many sufferers from osteo-arthritis could not stand the rigors of protein shock. Thyroid extract improved the general circulation and so indirectly affected the joint processes for the better. The hot douche was useful, but the current must be of the right strength, a strong current irritating the joint. He strongly favoured diathermy. Massage should be applied to neighbouring muscles, rather than to the affected joint. With regard to surgery, it must be remembered that the condition of these patients rendered them unable to stand severe operations. Arthrodesis and osteotomy seemed to be the only operations which were serviceable.

Discussion.

Dr. J. A. THOMSON said that often the radioscopic picture in osteo-arthritis was more an indication of the patient's resistance than of the disease itself. The level which radiology had now reached entitled it to a place in laboratory study concerning the origins and course of disease processes. He displayed on the screen a large number of radiographs of different joint conditions, and interpreted them. Incidentally he said that the presence of osteophytic growths in women was quite rare; he had seen only two cases.

Prof. TOM HARE and Dr. HENRY COHEN contributed a paper on the chemical estimation of synovial fluid and blood serum of horses affected with chronic arthritis. The investigation had been undertaken to ascertain the ætiology and pathogeny of equine chronic arthritis. The synovial fluid from an affected joint in each of 11 horses, and of the tendon sheath fluid of two bones, were chemically examined, also the blood serum of four of them. As controls they took five healthy horses of similar age and breed. The methods of procedure were minutely detailed. The conclusions arrived at were as follow: The synovial fluid and blood serum of the arthritics showed slightly lower chloride values than the normal. The phosphates, non-protein nitrogen, glucose, calcium, and uric acid of the synovial fluid and blood did not markedly depart from the normal. Excepting in one case the chloride values were higher for synovial fluid than for blood serum, in both arthritic and normal horses. Tendon sheath fluid seemed to have a constitution similar to that of synovial fluid of joints. Dr. Cohen elaborated the subject from the clinical side on the basis of his own experience. He drew special attention to the significance of early rigidity of the joint as an indication that something was wrong.

Dr. G. E. VILVANDRÉ claimed that osteo-arthritis was a definite entity, and it could not be expected that radiographs would infallibly reveal its early stages.

Dr. P. FIGDOR agreed as to the importance of trauma in these cases; in fact, he considered that osteo-arthritis was always a traumatic condition, and must be regarded and treated as a local condition, just as fracture. In osteo-arthritis of the shoulder-joint his cases had had pain two or three months before the onset of the bone condition, but this pain was below, not in the joint. In the hip-joint the pain was located in the thigh and remained the prime symptom throughout the disease. He had always treated his cases with diathermy; it was the only form of electrical current which the administrator could direct and control.

Dr. J. F. BRAILSFORD said that radiograms of most cases of osteo-arthritis of the hip-joint showed no evidence that coxa plana or congenital dislocation had existed previously. That osteo-arthritis did occur, probably in greater frequency in such hip-joints, as in other abnormal joints, was most likely due to the increased and abnormal strain to which they were subjected owing to the deformity. It had been stated that radiography was not of much importance in the diagnosis of this condition, since, when changes were visible, the disease had advanced so far that little improvement was possible. But the changes shown in the radiogram were typical of the condition and therefore most valuable in differential diagnosis. Patients were often seen who complained of pain in a joint or joints sometimes commencing without any definite injury, though as a rule a history of excessive and strained movements could be obtained. The radiogram of the painful joint showed no abnormal change, but a hidden focus of infection was often discovered, and in the case of dental sepsis, if the tooth from which the absorption was taking place was extracted, the painful condition of the joint cleared in a phenomenal manner, even though it had failed to respond to other measures. Dr. Brailsford was inclined to believe that this was the earliest sign of osteo-arthritis and that if this stage was missed insidious destructive changes took place in the joint. Often the patient experienced long periods of comfort between bouts of pain and it was probably on this account that he failed to subject himself to active treatment. It was only when there was limitation of movement and marked osteo-arthritic changes that they first appeared for radiographic examination.

Dr. C. W. BUCKLEY said the time for treatment of osteo-arthritis of the hip was before the radiogram showed anything abnormal there at all.

Mr. B. WHITCHURCH HOWELL thought that the cause of osteo-arthritis was always traumatic, occurring generally in the middle-aged or the elderly; unfortunately it was not presented for treatment until the disease condition had become well established. If only cases could be brought under treatment at an earlier stage, much more could be done for them than at present. The earliest sign of osteo-arthritis of the hip was trauma followed by synovitis of that joint; but at this stage the patient regarded it as trivial, and did not seek proper advice. Osteo-arthritis of the shoulder he regarded as very prevalent, though often overlooked. The orthopædic surgeon should insist on fixing the arm well above the patient's head, so that a free range of movement would result; if itwas strapped to the body the result would be unsatisfactory.

The PRESIDENT expressed his disagreement from those who maintained that osteo-arthritis was a local disease; he held strongly that it was a general disease with local manifestations. If a person with a traumatic injury to one hip were examined generally it would be found that the skiagram showed changes in the hip complained of, and that the other hip also gave indications of the same disease, though it had sustained no injury. He had a word of criticism as to the quality of the radiograms brought by patients; often a fresh set had to be taken, not only to see the extent of the damage, but also to prove to the patient that disease was present in the joint.

Dr. AGNES SAVILL spoke highly of the value of diathermy in joint conditions. It not only raised the body temperature in a general way, but also stimulated the various important secretions. Patients submitted to this treatment always spoke gratefully of the feeling of well-being it produced. To some of her arthritic cases she had given every kind of endocrine, auto-intoxication, and vaccine treatment, with little effect; but they had soon begun to improve on diathermy.

Reply.

Dr. GORDON, in reply, said he agreed with Dr. Cohen that the clinical signs must not be neglected. Stiffness of joints could not be looked upon as a sign of osteo-arthritis; there were many stiff joints in which the more grave condition did not supervene. He hoped the Section would not conclude from what had been said in its favour that diathermy was *the* treatment for osteo-arthritis, though he agreed it was a valuable adjuvant. In treating osteo-arthritis one must deal with the patient as a whole. He was in full agreement with Mr. Whitchurch Howell's remarks, especially as to the posture in which the arm must be placed for osteo-arthritis of the shoulder.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

At a meeting of this Society on Feb. 15th the chair as taken by Dr. J. HOWARD-JONES, the President, nd a discussion on the

CONTROL OF SMALL-POX

as opened by Dr. A. F. CAMERON. He said he referred the word "prevention" to "control" ecause the latter had no ideal before it and the whole bject of the medical officer was to prevent the spread f disease from a focus of infection. If he prevented econdary cases he had done all that could be asked f him. The present discussion might be said to ndicate an uncomfortable feeling that our methods ere not to be relied on and that their failure lay the system of control as laid down in public health gislation. The law gave to medical officers of ealth power to acquire information, to segregate fectious patients, and to carry out disinfection. he schedule of diseases for which this power was iven illustrated the lack of elasticity in the law and as one of the causes of the trouble with existing nall-pox. The Acts had come into force in 1889 nd 1891, when it was believed that destruction of ne materies morbi was essential to stop the spread f infection. The method by which the process of fection was naturally brought to an end had not nen been understood. Disinfection was the funda- nental principle upon which the law was based, nd in treatment the greatest attention was paid o the locale of the disease in order to kill the organism. f the poison could not be killed because it was idden in a living individual, that individual was egregated in hospital until the disease was at an nd. Knowledge had progressed but the law emained. Failure of secondary cases to appear as due to a pre-existing immunity in those who ame into contact with the patient. In hospital zone of control was set up around the patient, and this zone the immunised workers carried out isinfection. The two factors in segregation were, nerefore, disinfection and immunity, of which the tter was the variable factor. The efficiency of egregation varied proportionately with the degree f immunity in the zone of control. This might be atural or artificially produced. If the latter were vailable, perfect immunity in the zone of control ould be guaranteed, and for this reason segregation ust be more effective in small-pox than in scarlet ver or other diseases against which certain immunity ould not be produced artificially. In effect, therefore, egregation was only effective as a preventive of read when immunity could be guaranteed—i.e., hen spread could be prevented without it. The inimum degree of immunity required to prevent ne spread of infection was immunity of contacts, nd this could be guaranteed to prevent spread nly if it had been secured before the advent of fection. Removal to hospital was only useful if ne temporary respite from spread thus obtained were tively used to build up a zone of control.

The legal preventive measures were fundamentally fective and out of date, and there was little hope improvement until the law definitely recognised at immunity of those in contact with the focus infection was the primary factor in the prevention spread. It was a disadvantage that immunisation gainst small-pox depended on a living virus which d a pathology of its own. The people of the untry must, however, choose between continued ccination—until the bacteriologists produced a tter immunity method—and having small-pox as e of our commonest diseases. The single-insertion ccination had no advantages except that parents ight accept it more readily for infants, and its otective power was quite unknown; it reduced the ance of a take by 50 per cent. The mild disease evalent in this country now was indistinguishable, clinically and experimentally, from the more severe type, so that the name given to it did not matter and it must be dealt with administratively as small-pox. If compulsory power were applied to the immunisation of contacts the vicious circle would be broken. The mild type of small-pox had bred true for ten years and was of very little importance to the patient or the public health, but had been converted into a dangerous disease by a defective law. Its one important feature was its detrimental effect on trade and commerce, but that was a matter for business men and trade conferences to discuss. Doctors could show them how to prevent the disease if they thought it worth while; otherwise it was of no more importance than chicken-pox or rubella.

Small-pox and Small-pox Administration at the Present Time.

Dr. G. F. BUCHAN reviewed the history of small-pox in this country. Associated with the prevalence of mild small-pox since 1919 there had been smaller outbreaks of the classical variety. Mild outbreaks had been observed from early times, and variations in virulence were a constant feature of most epidemic diseases—e.g., influenza and scarlet fever. Animal experimentation seemed to prove that the virus of mild small-pox was identical with that of the severe disease. Arguments in favour of identity were: the same period of incubation, the same characteristic prodromal symptoms; the appearance of eruption at the same time, and its typical appearance. In this country, however, the prodromal symptoms in the mild form might be so trivial as to be overlooked even by the skilled observer, and the eruption did not conform to the classic description in its form of development. It was not yet known whether one type could give rise to the other or not. The Willesden outbreak did not support the hypothesis that the mild form could become the classical, because it was quite common in all diseases for an epidemic to start from one very mild case. The most important evidence was that of R. P. Garrow, who had stated that mild small-pox did not confer immunity against vaccinia for more than 8 to 12 months. This, however, did not establish the view that the two were different diseases, but rather that one was a variant of the other.

Present administrative measures included early diagnosis, removal to hospital, disinfection of premises, inquiries as to source of infection, prompt search for, and surveillance of, contacts, and vaccination. The "missed case" was undoubtedly the chief factor in the spread of small-pox, and facilities for skilled diagnosis were most important. There ought to be enough hospital accommodation for isolation of the early cases with a view to checking an epidemic. When the disease had got a hold there was reason to doubt whether hospitalisation was worth while for the mild form. No reliance could be placed on disinfection of premises, which might well be abolished for all infectious illness. Inquiry as to the source of infection was very valuable but by no means always successful. All contacts should be regi tered and visited daily for 16 days. Small-pox was not infectious before the rash appeared, and sufferers from prodromal symptoms should be isolated as suspects. Vaccination within three days of infection would prevent or modify an attack; the importance of finding and vaccinating contacts immediately could not be overestimated. Vaccination had hitherto been exploited as the lesser of two evils, but the prevailing type of small-pox was so mild that vaccination caused more absence from work than the disease. Headache and pain in the left abdomen, neck, and axilla were common after vaccination, and a few deaths from it occurred every year, apart from the occasional encephalitis associated with although probably not entirely caused by it. Nowadays small-pox caused fewer deaths than mumps or chicken-pox and, under all the circumstances, the recommendations of the Vaccination Committee were the only reasonable line to take. They advocated

three insertions, one in infancy, one between the ages of 5 and 7, and one on leaving school, instead of the usual four insertions in infancy.

Dr. A. E. BRINDLEY urged the necessity for power to obtain knowledge of intimate contacts; an astounding amount of prevarication was encountered, and the mischief was usually done before the case was seen. In Derby there had been 2008 cases of small-pox without death or marked disfigurement. Some cases had no eruption and others had a rash which no one could have recognised as small-pox if the case had not been a known contact. It should be an offence to give false information to the health authority. Power to obtain information was held by port sanitary authorities, and had been recommended by several conferences on small-pox. If the medical officer of health knew his contacts he had the reins in his hands. The statutory four insertions deterred people from submitting to vaccination. Small rural authorities could not possibly deal with this disease, and their areas formed reservoirs of infection. County councils should be made the responsible authority.

The Case against Hospitalisation and Vaccination.

Dr. R. P. GARROW argued that the reason for the discussion was that under the name of small-pox there were to-day two diseases which were quite different from the point of view of control. Their exact biological relationship was a matter of academic importance only. What were all diseases from the evolutionary aspect but fixed variants? If mild small-pox remained mild small-pox, surely it could be given a definite name, and until it was given a name it could not be treated differently from classical small-pox. A disease sui generis was one that gave rise to itself and to nothing else. "Influenza" was a name given to an infinite variety of diseases, and practically every case of mild small-pox had been labelled "influenza" in its first few days. The most important measure for mild small-pox was to give up hospitalisation. People realised that three weeks in hospital was "worth it," and refused vaccination for that reason.

Dr. R. W. JAMESON said that the recommendations of the Committee meant the immediate vaccination of 30 million people, and the further vaccination of five million annually, which was manifestly absurd. Non-epidemic vaccination was ridiculous and created antivaccinationists. Vaccination in infancy did not last a lifetime. Vaccination involved a 1/40,000 risk of encephalitis, erysipelas, and other complications, while mild small-pox involved no danger and little discomfort. We had no right to vaccinate against variola minor. Contacts had every chance of vaccination if severe small-pox arose. The public recognised the difference between the two diseases and would not object to vaccination in a grave epidemic.

Dr. J. T. NASH said that patients with mild small-pox would choose hospital instead of vaccination every time. He hoped the Society would seriously consider whether vaccination was justifiable when it was often worse than the disease against which it protected. He had noticed that the eruption of variola minor sometimes matured very rapidly, especially in old people, so that after 16 hours the pustules looked four days' old.

Dr. R. M. PICKEN said that it would be scientifically unsound to describe the two forms by different names, although undoubtedly they were administratively quite different. He knew no other two diseases against which immunity could be produced by the same procedure and which immunised against one another. Many cases of the most virulent type might be missed because there was no eruption, and mild missed cases might occur amongst the unvaccinated as well as the vaccinated. Universal vaccination must be advocated for classical small-pox, and the procedure must be modified for the present type. The public were quite intelligent enough to appreciate this. There was something to be said for abandoning hospitalisation, but this mild disease had at any rate provided a valuable opportunity for making local authorities bring their hospitals up to standard. When classical small-pox came again—as it undoubtedly would—we should be better able to deal with it as a result of this mild type.

The PRESIDENT spoke in favour of vaccination of contacts and isolation of cases, and said that the method of vaccination should be improved.

Dr. CAMERON and Dr. BUCHAN briefly replied.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

A MEETING of this Association was held at the B.M.A. House on Jan. 22nd, Miss F. HUXLEY, the President, being in the chair.

A paper was read by Dr. DOROTHY DOUGLAS on the working of the

Mackenzie Institute of Clinical Research at St. Andrew's.

After outlining briefly the foundation of the Institute, and commenting on the life and work of its great originator, Dr. Douglas went on to explain the aims of the organisation. These were, principally: (1) to obtain a large series of accurate life-histories of the health of individuals, whose circumstances, habits, and, if possible, antecedents were known; and (2) by an intensive and minute study of cases of disease, especially in its early stages, to arrive at a better knowledge of the meaning of symptoms, as opposed to physical signs.

Disease states might be divided into two groups: first, those in which there are symptoms only, without physical signs, and therefore only disorder of function; and secondly, those in which physical signs could be elicted, and therefore structural change might be postulated. It was always Mackenzie's aim, by an early recognition of the first group, to prevent the occurrence of the second. St. Andrew's was chosen as the site for such a research, chiefly because it is a very small and somewhat remote town. This makes it comparatively easy to follow up patients and to discover facts about their families and circumstances; moreover, it is there possible to keep in touch with individuals over a large number of years, since the population is more or less stationary. For much the same reasons it was decided to staff the Institute entirely from general practitioners of the town, since they would naturally be the first to see the earliest symptoms of disorder. At the present time it was found practicable to employ in addition a full-time pathologist and bacteriologist, a radiologist, and a pediatrist. The services of the general practitioners were entirely voluntary, and the general feeling locally, both among the doctors and the general public, was that the work, besides being part of a most necessary research, acts as a stimulus to thought and discussion, and much increased the interest of the routine of general practice. Many important papers had been published by the Institute since its foundation, and a comprehensive mass of material in the shape of accurate clinical notes of a large number of cases of special interest had been gathered together. This material was available to investigators following out a particular symptom or disease. It was to be hoped that such unique opportunities for clinical research as were offered at the Institute would be utilised to the full.

BRISTOL EYE HOSPITAL.—The annual report shows that last year 13,116 out-patients attended, an increase of 1000 over the preceding year; there was also a substantial increase in the number of in-patients. The need of larger premises is urgent, and the number of beds needs to be doubled, but enlargement has been postponed until the whole question of the Bristol hospitals has been considered by a body which is in process of formation.

Reviews and Notices of Books.

Radium Treatment of Cancer.

By Stanford Cade, F.R.C.S. Eng., Assistant Surgeon to the Westminster Hospital. London: J. and A. Churchill. 1929. Pp. 158. 15*s*.

No time could have been more opportune than the present for the appearance of this book by Mr. Stanford Cade. Every hospital in this country is either procuring, or endeavouring to procure, a supply of radium, great or small. It is one thing to possess radium, but quite another matter to employ it scientifically and therapeutically. There is no question that this sudden popularity of the precious element is not without danger. In the hands of skilled workers radium is wonderfully useful, but in those of the amateur it is apt to be useless or worse. Much of the value of the work before us is due to its being a record of the experience of an operating surgeon, who has, after much experience, decided that in certain situations of the body cancer is as well treated by radium as by the scalpel, if not better treated. Mr. Cade reminds his readers that radium therapy is still in its infancy, and its employment demands special knowledge and special methods of technique; and he admits that what he teaches to-day may be merely of historical interest before many years or even months are passed.

After a useful chapter devoted to the various general methods by which radium salts or emanation may be applied to a tumour, and a description of the different forms of application, Mr. Cade takes in order the various lesions that he and his colleagues at the Westminster Hospital, and workers at St. Bartholomew's Hospital and the London Radium Institute, among others, have been treating for the last five years or more. He begins with cancer of the buccal cavity, and this is perhaps the most interesting and important chapter of all, since the immediate and local results procured by radium on the primary growth in this neighbourhood altogether surpass those due to surgery; but he freely admits that the problem of how best to deal with the lymphatic glands is not yet settled. The technique for radium treatment of cancer of the tongue is elaborate, and should be carefully studied by a surgeon before he undertakes the treatment of a case without previous experience. In the chapter devoted to treatment of carcinoma of the larynx, the author quotes at some length from the published writings of Mr. Douglas Harmer, who has demonstrated remarkable results in cases of intrinsic carcinoma of the larynx, after irradiation by means of a window cut in the thyroid cartilage. In two other conditions radium has proved its great value—cancer of the breast and cancer of the cervix of the uterus. In malignant disease of the rectum the results have so far been less satisfactory, and no single method of approach has yet been decided upon, although Sir Charles Gordon-Watson has achieved several remarkably good results with platinum needles, and also with radon seeds.

A prolonged excursion deep into the physics of radium is not to be expected in a text-book of this kind, but in Mr. Cade's description of the time factor he neglects to include any reference to the filter; an omission which must be a slip, since it is of paramount importance to know if platinum, gold, silver, or lead is to be used, and the thickness in millimetres in each case.

We strongly advise any surgeon who thinks of taking up the treatment of cancer by radium to read carefully this excellent text-book. An important feature is the large number of coloured plates and diagrams by which the book is profusely illustrated.

Modern Views on Digestion and Gastric Disease.

Second edition. By Hugh MacLean, M.D., D.Sc., F.R.C.P., Professor of Medicine, University of London; and Director of the Medical Clinic, St. Thomas's Hospital. London: Constable and Co., Ltd. 1928. Pp. 182. 12*s*.

The value of this book depends not so much on a wide survey of gastric physiology and pathology which its title might lead one to expect, as on the clear and concise manner in which a method of treatment, based on known facts of physiology and pathology, is set forth. The attempt at simplification has brought in its train dogmatism on some controversial topics, but, on the whole, this attitude may be justified, so great is the need for definite guidance in treatment of disorders of the intestinal tract. In this edition the views previously expressed on duodenal regurgitation as a physiological process have been abandoned; the reasons for this change of outlook are clearly given. Facts are advanced to support the theory that the stomach, besides secreting hydrochloric acid, also secretes sodium chloride, and that although there is no quantitative relationship between the hydrochloric acid and pepsin, the latter bears a very definite relationship to the amount of sodium chloride. A chapter is devoted to the fractional test-meal. Prof. MacLean fully agrees that this method is of great value in the scientific investigation of gastric disease. He still considers, however, that the deviations between normal and pathological are not sufficiently well known to render the method of very much greater value than the simpler single estimation in ordinary clinical work. The chapter on treatment confirms and emphasises the results obtained by intensive alkali therapy on the lines first advocated by Sippy, and Prof. MacLean claims that even patients suffering from pyloric stenosis are often greatly benefited by this treatment. Alkalosis is described as a very rare complication and some useful notes on its recognition and treatment are given. The excellent X ray photographs of gastric conditions supplied by Dr. Geoffrey Fildes add greatly to the value of the book.

Infant Welfare.

Infant Feeding and Nutrition. By Howard B. Gladstone, M.D. London: W. Heinemann, Ltd. 1928. Pp. 118. 7*s*. 6*d*.

In this book Dr. Gladstone presents the result of many years' experience at the Sydenham Infant Welfare Centre, in a form which gives practical guidance to practitioners in the subject of infant feeding. He does not adhere closely to any particular system, but describes a large variety of methods of feeding with fresh and dried milk, including both percentage feeding and simple dilutions, in all of which he has obtained success. A considerable part of the book is devoted to the consideration of different varieties of dried milk and proprietary foods, and their relative merits. The progress of a number of individual cases is recorded, and illustrated by feeding and weight charts. The last chapters give a brief summary of the rôle of vitamins and of heliotherapy in infant nutrition.

Sozialhygiene im Säuglings- und Kleinkindesalter. By Eugen Stransky, Vienna. Leipzig and Vienna: Franz Deuticke. 1929. Pp. 129. M.8.

In this monograph Dr. Stransky reviews the effect of social and administrative work on disease and mortality in infants and small children, as shown by statistics drawn from various parts of the world, and he gives some account of methods of which he has had experience in Austria. The most striking fact which emerges from his comparative tables is that the mortality in the new-born and the first month has remained stationary throughout the world, in contrast to the very great reduction which has taken place in the total infant mortality during the last decade. The

extent to which this neonatal mortality might be reduced by antenatal centres and obstetric institutions is discussed. The author recognises candidly that a complete abolition of infant mortality would exert a deleterious effect on natural selection, but he believes that a rate of 30 per 1000 births (contrasted with 100 in Germany and Austria) would be an adequate safeguard. The last portion of the book is devoted to children of the pre-school and early school ages, and is largely concerned with the prophylaxis of infectious disease and the assistance obtained from laboratory tests such as those of Schick and Dick. The author is convinced that under modern conditions it is essential that all children of the labouring classes shall be brought under highly organised medical control.

ETYMOLOGICAL DICTIONARY OF CHEMISTRY AND MINERALOGY.

By DOROTHY BAILEY, Sc.B., Ph.D., and KENNETH C. BAILEY, M.A., Sc.D., Fellow of Trinity College, Dublin. London: Edward Arnold and Co. 1929. Pp. 307. 25*s*.

THE aim of the compilers of this dictionary is primarily etymological. They desire to inform the reader who is curious about such things the derivation of chemical and mineralogical names. Trade names have been omitted with the exception of a few of the more important, such as aspirin, the derivation of which is set out as follows: "Aspirin, trade name for acetyl-salicylic acid. A(cetyl) and spiræic acid (old name for salicylic acid found in *Spiræa ulmaria*) Pflüger's Archiv, 1899, lxxvi., 307." Another interesting note concerns "Sklodowskite, hydrated silicate of uranium and magnesium. After Mme. Marie Curie (née Sklodowska), famous for researches on radio-active substances." As regards stovaine the authors state "Derivation not discovered; possibly from English *stove*, in jesting allusion to the name of the discoverer, Fourneau, & -aine (as in cocaine)." They have made a good guess, of which the confirmation will be found in THE LANCET (1920, i., 358). The derivation of Jade "from the Spanish *Piedra de ijada*, colic stone from the belief that it protected from nephritic colic," is curious. The word "Spelter," the commercial name by which zinc is more generally known in the metal market, might have been included. Spelter is, etymologically, curiously akin to pewter, which is not always only an alloy of tin and lead. The dictionary is certainly interesting and useful. It does not contain all the names of the minerals and synonyms which are to be found in Dr. T. Egleston's Catalogue published in 1892, but it gives entertaining notes which the catalogue omits on the etymology of some of the names.

THE WOMAN A MAN MARRIES.

By VICTOR C. PEDERSEN, M.D., A.M., F.A.C.S. London: Jarrold and Sons, Ltd. 1928. Pp. 247. 6*s*.

THE presupposition of this book is that ignorance is at the root of most evils. It contains six chapters, the titles of which are: ignorance of biology and physiology, ignorance of social development, ignorance of social conditions, ignorance of venereal disease, ignorance of marriage, and ignorance of the relief. The relief would appear to be constituted by those measures propounded by education, the law, and the Church for the solution of the problems of sex. Enlightenment on these six topics will, it is submitted, give rise to the conviction that "immorality is a nightmare in the recorded history of man," and that "monogamy as a social product and marriage as a personal contract based upon it are fundamental to the most civilised society of to-day." The method of exposition combines a presentation of the alleged basic scientific facts of sex with a narration of case-histories of marital disharmonies after the manner of Judge Ben Lindsey. The author is an American, and the book is written from an American point of view. The case-histories it contains are of American couples, and the legal solutions discussed are from American State and Federal laws. The book will chiefly be valuable to English readers who are interested in America.

THE SHADOW OF THE WORLD'S FUTURE.

By Sir GEORGE HANDLEY KNIBBS, C.M.G., F.R.A.S. London: Ernest Benn, Ltd. 1928. Pp. 131. 10*s*. 6*d*.

IN the words of its author, "this book is an exposition of the consequences of the limited population-carrying capacity, under various conditions, of our earth." Man's agricultural, forestal, and animal needs, the world's cereal and food crops and its mineral needs, and the complicated problems of international migration are dealt with from the statistical point of view in successive chapters. The conclusion reached is that in a short time the multiplying force of man will receive a tremendous check. When the shadow of over-population looms large, the world politic will be confronted with a complex problem possessing racial, economic, and moral aspects. It will have to decide whether it is better that there should be larger numbers and more modest living, or fewer numbers and lavish living; and whether world morality should aim at the enjoyment of life by a great multitude or at the restriction of life experience to a few, who may live in relative opulence. Whether the world politic will make its decision through the unconcerted action of separate individuals responding, each in his own way, to economic pressure, or by edicts emanating from a central world-state, or from different governments, the author does not venture to prophesy.

A COLONIAL YEAR BOOK.

The South and East African Year Book and Guide for 1929, with Atlas. Edited by A. SAMLER BROWN, F.R.M.S., and G. GORDON BROWN, F.R.G.S. London: Sampson Low, Marston and Co., Ltd. Pp. 912. 2*s*. 6*d*.; by post, 3*s*.

THIS volume is written simply to give information for passengers by the Union Mail Steamship Co., but it really forms an excellent history of those of the Colonial possessions which are brought into contact with the home country by the various routes of the company. It is not merely a detailed handbook to the ports of call, but it deals with the early history and subsequent developments of the countries concerned, giving an intelligible story, for example, of Cape Colony, Natal, Zululand, and the Transvaal, followed by an excellent account of the Union of South Africa and of Southern Rhodesia, formerly the British South African Company's territory. East Africa is treated with similar fullness, Kenya Colony, Uganda, Tanganyika, and the adjoining territories being described. Throughout we have notes upon climate, agricultural administration and farming, emigration, the acquisition of land, mining, and, lastly, the diseases that may be incurred, the whole being rounded off with general information as to the fauna and the sport in these vast countries. The book is sold at a low price in the hope that the act of placing such an exhaustive work at the easy disposal of the public may assist in a great migration movement within the British Empire, with the view that such a movement is a vital necessity at the present time. It contains nearly a thousand pages with plans and diagrams, and a specially prepared atlas of 64 pages and maps in colour.

THE book on "William Harvey," by Archibald Malloch, reviewed in THE LANCET of Jan. 19th, is now published in this country by Mr. Humphrey Milford (Oxford University Press) at 7*s*. 6*d*.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 23, 1929.

EXPOSURE TO COLD.

ARCTIC conditions in the temperate zone of Europe during the past fortnight have led to an unwilling study of the effect upon the human body of exposure to cold. This effect is popularly supposed to be a primary one of stimulation to metabolism and to the nervous output of energy, followed, as the exposure is prolonged and increases in severity, by a reaction in which the general functions of the body become depressed and the liability to disease processes, especially of an inflammatory nature, is increased. The occurrence of large numbers of cases of so-called trench-foot during the late war induced some experimental investigation of this condition, but the conclusions reached by various workers showed little agreement. Attention was mainly confined to the local lesion; hardly any reference was made to widespread effects upon the body as a whole. Most animals have resisting powers of a high order, and the general effects of cold when they occurred were attributed to secondary causes rather than to the cold itself. The first systematic inquiry into the effects of cold upon individual tissues was made by Mr. NORMAN LAKE towards the end of the war period.[1] Working with tissues growing in vitro, and thus isolated from any vascular reactionary effect, he was able to prove that there was a critical temperature in the neighbourhood of minus 6° C. (equivalent to 21° F.) below which cellular life, in all higher forms of life, was destroyed. At temperatures a little above this limit tissues could be stored for prolonged periods without showing any diminution of vitality when again thawed. Explanted portions of embryo heart, kept growing and pulsating in the incubator for two or three days, could be stored in a state of suspended animation for two to three weeks at minus 1° C. only to resume normal growth and pulsation immediately they were again raised to the appropriate temperature. The complete excised heart subjected to similar treatment began again to beat normally when thawed and perfused with nutritive fluids at the proper pressure, and this was found to be true of all tissues. Below the critical temperature mentioned protoplasm itself freezes and its intimate colloidal structure is destroyed, so that while it remains chemically unchanged the physical architecture, so essential for the continuance of vital processes, is disrupted. A somewhat similar change can be seen during the freezing of a simple substance like gelatin when, at the critical temperature, the translucent mass suddenly becomes opaque owing to the disruption of the continuous phase of the colloidal system. In this case the colloidal structure is again attained upon warming, but the change in cytoplasm is irreversible. From a theoretical consideration of the electrolyte content of cytoplasm the freezing-point would be expected to be in the region of minus 0·7° C.

LAKE subsequently showed[2] by an investigation of the freezing curves of various types of protoplasm that the discrepancy was explained by the phenomenon of super-cooling, and he was led to the conclusion that in the cytoplasmic colloidal system the more fluid phase was the disperse one—i.e., that it had the structure of a gel. The isolated droplets of this phase, protected from all external influences except the cold, invariably undergo super-cooling; once the colloidal structure has been destroyed, however, the resultant material freezes at the correct theoretical temperature of minus 0·7° C.

The essential difference in the effect of cold above and below the critical point was further proved by investigations upon animals and upon the human skin. LAKE was thus able to demonstrate a fundamental difference between true frost-bite and the effects of chilling. In the former there is direct and immediate cellular destruction; in the latter the tissues remain intact in a state of suspended animation until thawing occurs, the subsequent pathological effects being due to stasis and to the pressure of exudations, which may be so intense as to produce a secondary gangrene. The cause of the exudation is a vasomotor paralysis accompanied, it may be, by some increased capillary permeability; both of these factors are enhanced when the thawing is rapid. In LAKE'S experiments it was shown that these reactionary effects could be entirely prevented by any means which restricted the capillary flow and pressure. Thus the local use of vaso-constrictors or ligation of the main artery to the limb prevented, paradoxically enough, the onset of gangrene. The fibrinous nature of the exudate which occurs after chilling often produced lymphatic blockage, the effects of which were seen long after the vascular condition had subsided, a fact which probably explains the predisposition to further attacks. The manner in which the vasomotor changes are produced is uncertain. Section or blocking of the somatic nerves supplying the part does not prevent the onset of the condition; periarterial sympathectomy, although increasing the circulation through the normal limb, proved of no value in these experiments—a result which was to be anticipated since the resulting vaso-dilatation would only tend to increase the exudation. The vasomotor effect is probably a local one due perhaps to a temporary paresis of the musculature of the arterioles. A. E. WRIGHT and L. COLEBROOK suggested[3] that the effects were due to a local acidosis which also predisposed to infection, while other authors attributed it to local ischæmia, nervous exhaustion, and infection. Whatever the ultimate mechanism may be, it is clear that the main effects of chilling of the tissues are due to vasomotor reaction; they are thus seen chiefly and in severest form in those whose vasomotor system is unstable and characteristically in the young.

From the practical point of view it must be appreciated that the external temperature necessary to produce actual frost-bite will lie far below the critical point of minus 6° C., owing to the heat conveyed to the surface from the warmer underlying structures; for this reason frost-bite is rare in this country, although it is occasionally met with in exposed situations and in airmen who are insufficiently protected. The commonest local effect of cold is the chilblain, in which the capillary engorgement and exudation are sufficiently obvious. Until recently chilblains were rarely seen except upon the feet, hands,

[1] Report upon an Investigation into the Effects of Cold upon the Body, THE LANCET, 1917, ii., 557.

[2] Preliminary Report upon the Pathology, Prevention, and Treatment of the Condition known as Trench Foot. (Unpublished report to War Office.)

[3] On the Acidosis of Shock and Suspended Circulation, THE LANCET, 1918, i., 763.

and ears, but large chilled areas are now sometimes found on the leg, a phenomenon which possibly bears some relationship to the change from wool to silk stockings. The means of prevention which proved satisfactory in the case of trench-foot may also be applied in civil life. Of these the most important is the retention of a layer of dry air next to the skin surface by the use of a covering of non-conducting material having a fine reticulate structure. When exposure to wind is added to cold an outer layer impervious to air is essential if excessive heat loss is to be prevented. Water being a good conductor of heat, all clothing should be kept as dry as possible by adequate ventilation. The problem is one of maintaining a proper balance between the supply of heat to the part and that lost. The supply is derived from the circulating blood and the local metabolism; in sedentary occupations the latter is reduced to a minimum and in consequence the heat loss must also be reduced. The main factor in this reduction is the automatic contraction of the superficial vessels; this should therefore not be counteracted unless at the same time the circulation and metabolism of the deeper parts be increased—e.g., by exercise. Foods rich in fats and carbohydrates help to build up a readily available caloric reserve, which, through the increased tone of the muscles, supplies additional heat even when the latter are at rest. Internal administration of various remedies has been popular in the treatment and prevention of this condition from time to time, but none of them appears to be wholly successful. From a consideration of the pathology of chilling it would appear that the only logical substances to use are general vasomotor tonics which tend to produce constriction, especially of peripheral vessels. Perhaps the best example of these is strychnine. Where large areas of the body are exposed the heat-loss may be so great that the normal balance between production and loss cannot be maintained and the internal body temperature begins to fall, metabolism is diminished, and a vicious circle arises which, unless broken, ends in death. In such cases the tissues are only in a state of suspended animation, so that if the circle be broken by the artificial supply of heat to the body there is every prospect of recovery. Stories of animals frozen to death and thawed out alive are well documented, and experiment has shown that in embryos and very young animals such a state of suspended animation may exist for several hours without deleterious effects upon subsequent vitality. That such degrees of exposure when recovered from are likely to be followed by inflammatory reactions in internal organs, such as the lungs and kidneys, is common knowledge; they are due to the onset of changes similar to those in superficial structures.

The less severe degrees of exposure met with in temperate climates are adequately compensated by the thermogenetic centres so that the general body temperature does not alter appreciably. The sequelæ sometimes seen in internal structures cannot then be explained on the basis of chilling; they are possibly due to a slightly diminished resistance in the presence of a pre-existing lesion or infection, or to a reflex effect through the nervous system—e.g., the intestinal colic occurring in predisposed subjects, which gives rise to the wearing of a cholera belt. On the other hand, in the upper air passages there may be actual tissue chilling on which exudation follows. To sum up: While the local effects of exposure to cold are evident, the general effects of moderate exposure are slight—a conclusion which agrees with that reached by most investigators of trench-foot during the war.

WORKMEN'S COMPENSATION AND THE MEDICAL REFEREE.

IT may be useful to give publicity to the dicta of a judge of the Court of Appeal in Scotland on the form, and particularly the substance, of the certificates given by medical referees in the course of an arbitration under the Workmen's Compensation code. The observations were made in BROWN AND WILLIAM DIXON, LTD., reported in *Scots Law Times*, 1929, p. 109, and emanate from Lord SANDS, a sound lawyer and a man of wide sympathies and manifold interests. His lordship, after pointing out that the report of a medical referee is final, continued: "It has been found necessary in some cases to refer back to the medical referee to explain his meaning. This necessity has generally arisen from the fact that the report was not clear and unambiguous in its terms. Now, I can quite appreciate that in regard to such matters as are revealed to a medical referee, it may sometimes be difficult to form an absolutely confident opinion. But this difficulty does not justify the referee in giving a halting report. Certain definite questions are referred to the medical referee. He has got to make up his mind, and doubts and difficulties he may experience in the process should not be reflected in his report, which should be succinct, definite, and categorical." Many of our readers may be inclined to comment on those words by finding that while it is easy for the eminent lawyer to lay down for them the path of duty, members of another profession may find it practically impossible to comply with the precepts. They will recall that the questions placed before them are often obscure and open apparently to conflicting answers, and they will feel that only ignorance or self-conceit would lead a doctor to deny the possibility of varying opinions having equal probabilities of representing the truth. It should, therefore, be made clear that Lord SANDS is an eminently reasonable man, very far from desiring to dictate, or to lay impossible burdens on others.

Lord SANDS'S remarks were made in a case where the medical referee had first given one certificate and then a directly contradictory certificate; the county court judge had been accordingly misled in procedure, with the result of a successful appeal by the employers to the Court of Appeal, all leading to the piling up of law costs. Take Lord SANDS'S three requisites for a medical referee's report. It is first, to be "succinct," and that means that no reasons for his views are required from the referee. But whenever it is permissible to state a decision without giving the reasons, it is foolish to do so; it is sufficient to be able to adduce the reasons when they are asked for by those who have a right to learn them. Every decision, in whatever sphere, must be reached by a course of reasoning, in which the steps may be numerous. Possibly at every one of these stages more than one direction for the next step appears possible, and a choice has to be made, accepting one and rejecting the others. If all these are to be stated and the reasons for acceptance and rejection, the report will not be succinct, but will become a tortuous maze, the threading of which will waste time and invite error. Next, the medical referee is to be "definite." That means that he is to yea or nay, and the biblical injunction applies: "let your communication be, yea, yea; nay, nay." There is no room for the hesitating counsellor. Mr Facing-Both-ways, with his view that "black's not so black, nor white so very white," is a danger and not a help. Thirdly, the medical referee is to be

"categorical." So far as this is not a repetition of the preceding, it simply means that, if more than one question is referred, they ought to be dealt with separately, and separate answers returned, each clearly and expressly dealing with one question. It may be noted, however, that Lord SANDS employs the word "report," a little inaccuracy which would exactly condone the discursiveness which he is condemning. The Act speaks of "decisions" and "certificates." These may be contradistinguished from a report, for the latter is naturally a full and exhaustive, and it may be even a discursive, document. A report which ignored all symptoms and arguments tending to the opposite of the conclusion reached by the reporter would expose itself to adverse criticism. In face of the judicial animadversion on the form of doctors' "reports," it may be indicated that the references to the medical man are not submitted in the best form. In the case of juries it is usual to leave the issue to them in the shape of specific questions formulated by the court, and deliberately framed so as to be capable of being answered by a "Yes" or by a "No," or in some other way not really essentially different. Clearly such answers are what are desiderated by Lord SANDS, and in the same case the Lord President, Lord CLYDE, expressly said that the answer ought to have been "Yea" or "Nay." Rules and forms have been issued for the guidance of medical referees, but these have come under judicial criticism in England. Certainly they seem to proceed on the wrong lines. The idea at the back of them is that the medical referee shall use a printed form, and shall, as it were, frame a paper, which may be called a report, but the authoritative part of which shall be his decision, or certificate, or both. The better way would be that the document should reach the referee with the reference, and complete in all respects up to and including succinct, definite, and categorical statement of the questions referred, with blanks for the answers of the yea or nay order. Then, and then only, would it be altogether correct to say, in the words of Lord SANDS, that "certain definite questions are referred to the medical referee."

It occurs at once to all our minds that what is demanded of medical referees is a standard of the categorical imperative to which the judicial bench does not attain. It is not uncommon for a judge to state that in the course of the case he has altered his opinion, and that in the end it is only with great hesitation that he has arrived at his decision. And as regards discussing the arguments pro and con, that is the rule rather than the exception in judicial utterances. But really there is no comparison between the situations, and indeed in some countries judges are bound to state in detail their reasons. They are bound to follow judicial precedents even contrary to their own opinions; and usually these are not final. A medical referee is in a different position. He is not bound to follow other medical opinion, however eminent; and not subject to any right of appeal, for what he says is "final" and "conclusive." In a sense that makes his position more difficult; a judge frequently states from the bench that he hopes an appeal will be taken against his decision, while the medical referee has no such chance of confessing fallibility. Power must always carry responsibility; and the weight of that will be felt more acutely by one man than by another. But most men are conscientious, and deeply anxious "honeste vivere, alterum non lædere, suum cuique tribuere," which has been called the holiest civil wisdom. And is the issue which the medical referee has to decide in no way unique? Other men have to face greater responsibilities, and every doctor has to do so constantly in ordinary practice. No doubt in some of the latter instances he can call in a specialist, but that only shifts the burden from A to B; and in the references made to the medical referee in cases of workmen's compensation the referee *is* the specialist.

CHRONIC RHEUMATIC ARTHRITIS.

THE progress of our knowledge of chronic diseases of bones and joints has been slow and is still in process of evolution. Although arthritic changes found in fossil bones show that our remote ancestors suffered from these disabilities, we are far from having a clear notion of their pathology. The old-time physicians were vague enough as to the definition of rheumatism; but they felt that, though inflammation of one joint might be caused by trauma, inflammation of several joints should be accounted for by a "rheumatoid" state—the presence of a humour floating in the blood and causing disease. The search for the peccant humour continues and the explanation of the mechanism of its action remains hidden. Chronic arthritis being a disabling rather than a killing disease, there was seldom opportunity to observe the early changes in the joints, while in the later stages the pathological pictures were confused by the presence of degenerative changes side by side with those of long-standing inflammation. The cause and pathology being thus obscure, attention was directed to the clinical aspects of this group of diseases, and, as observations accumulated, differences appeared to suggest the possibility of division into several types. By the beginning of this century A. E. GARROD [1] had reached the position that the great bulk of the cases spoken of as examples of rheumatoid or osteo-arthritis would seem to be examples of two maladies which present distinct clinical features, both infective, but probably caused by different organisms, which he proposed to name rheumatoid arthritis and osteo-arthritis. With no sure pathological basis, these and other terms were used by different observers in different senses, new classifications were put forward which divided up the cases in different ways, and confusion reigned in the minds of students and practitioners, even (it was suspected) in the minds of learned professors themselves. In all these clinical classifications—a typical one is that proposed by NICHOLS and RICHARDSON [2] in 1909 and adopted largely in English-speaking countries—there is a tendency to distinguish broadly between the more active inflammatory course and the prolonged reactive or degenerative type. Indeed in some countries the division has been made, albeit on insufficient pathological grounds, into cases of "arthritis" and those of "arthrosis." So many tissues enter into the structure of a joint—synovial membrane, cartilage, bone, capsule, ligaments—that the response to inflammation may be very varied. As in a mountain chain the different strata are so arranged that the peaks have diverse and individual characteristics, and the traveller from the west is met by steep declivities and sheer walls quite other than the gentle decline of the spurs and foothills of the eastern side of the same mountain range; so, in the present-day view, the diversity of this group of diseases is regarded as apparent rather than real.

[1] Articles on Rheumatoid Arthritis and Osteo-arthritis in Allbutt and Rolleston's System of Medicine, Vol. III., London, 1907. [2] Jour. Med. Research, 1909, xxi., 149.

and the result of varying reaction between the intensity of infection and resistance.

It was the more chronic forms which occupied the attention of the Royal Society of Medicine last week in a discussion on osteo-arthritis (reported in another column), but the divergence of clinical views was still there. Some speakers regarded osteo-arthritis as a local condition affecting one joint only; others considered that it was a general disease with local manifestations. Dr. R. G. GORDON, who opened the discussion, alluded to the lack of a clear pathological definition of the conditions classed under this heading. He regarded them mainly as degenerative processes. He emphasised the effect of trauma, either in producing direct damage to the joint or indirectly in affecting it through strain; indeed trauma was to his mind a much greater causative factor than infection. In this connexion we recall attention to the work of LERICHE and BRENCKMANN [3] who grafted pieces of bone into the neighbourhood of animal joints. They found that the presence of dying bone appears to act as a stimulus to the production of new cartilage and bone, and they suggest that foci of necrosis in the epiphysis may provoke the outgrowths of bone and cartilage in cases of arthritis. The necrosis may be the result of embolic infection, or may be brought about by injury of the central cartilage which is the least nourished tissue of the joint. Local chemical alterations may play their part. Prof. TOM HARE and Dr. H. COHEN carried out chemical estimations of synovial fluid and blood serum of horses affected with chronic arthritis; both fluids showed lower chloride values than those of the normal horse. Further help may be expected from experimental pathology and biochemistry in clarifying the diagnosis and indicating appropriate treatment. Interest is growing. The past year has seen the inauguration of a National Campaign for Combating Rheumatic Diseases. This is a logical movement, for these diseases are of first-rate importance owing to their disabling effects on the individual and the loss incurred by industry and the community as a whole.

Annotations.

"Ne quid nimis."

THE KING.

THE only official bulletin issued during the past week speaks of slow progress and an increase in weight. The weather has been far from favourable to invalids, and Aldwick has had its share of dull days and sharp frost. There has been warm sunshine at times, however, and despite ice on the foreshore and a snow-strewn countryside, conditions at Craigweil House are certainly more stimulating than they are in London, where fogs are everyday occurrences. Though still very weak and unable to receive visits from any but his own family, the KING is now able to take ordinary food. His improvement, which is no slower than was anticipated, should gather speed as it progresses, and it is evident that a good deal of ground has been gained since His Majesty reached the South Coast.

THE SEBORRHŒIC STATE.

IT is a truism to say that the whole of our complicated nervous system is a specialised and protected piece of skin, yet, well known as this fact is, our attitude to the two ectodermal mechanisms remains completely different. For we treat our skin with contempt and our central nervous system with the utmost respect. An enormous amount of work has been done on the bacteriology of the nervous system, but relatively little on that of the epidermis. We know that the central nervous system is elaborately protected from bacterial invasion by a lymph-space, through which it is difficult for organisms to penetrate, but it is not so commonly realised that the true skin is almost as well protected by its horny layers, which are never penetrated when intact. This, as Dr. H. W. Barber pointed out in his first Lettsomian lecture, delivered before the Medical Society of London on Feb. 18th, is largely due to the presence in sweat of cholesterol fats, which are not a suitable culture medium. At this point, however, the vulnerability of the skin does become apparent. A trivial infective lesion in the brain cannot collect to itself the astonishing number of adjuvant organisms which a similar disorder of the skin invariably attracts.

The three most common of these organisms, according to Dr. Barber, are the pityrosporon of Melasseg (the "bottle bacillus"), the micro-bacillus of acne, and *Staphylococcus albus*. He calls them the "seborrhœic triad," because seborrhœa is by far the most frequent predisposing factor to their growth. The seborrhœic is perhaps the commonest diathesis known to us, and may be a valuable indicator of faulty metabolism. Dr. Barber points to it as an example of how a metabolic change resulting from unnatural conditions of life may produce an environment which enables harmless saprophytes to become parasites and produce disease. Each of the organisms has its site of election in the skin and stimulates a special type of cell response when it becomes active. The pityrosporon grows between the layers of the stratum corneum, the resulting dandruff or scurf being an attempt to cast off the parasite. In the scabrous skin it provokes definite clinical and histological signs of inflammation. The acne bacillus flourishes in the infundibular portion of the pilo-sebaceous follicles, and may promote a non-inflammatory or an inflammatory defence reaction—the comedo and the pustule. Staphylococci usually take their place at the ostium of the pilo-sebaceous follicle, and the body's normal defence to their invasion is the polymorphonuclear leucocyte.

The mild seborrhœic state, according to Dr. Barber, is so common as to be almost universal, but those in whom manifestations are severe enough to demand treatment are of two types: the flourishing, robust, active, plethoric—or "simple"—seborrhœic type and the pallid, thick-skinned, pigmented, hypotonic, toxic type. Their skin appears thickened, coarse, and dirty; the horny layer is improperly formed and hypertrophied, the pilo-sebaceous orifices are enlarged and patulous, exuding droplets or filled with solid plugs. There is often visible hyperidrosis; the scalp is greasy and dandruffy, and the hair dank and lifeless. To this picture various infective complications may be added. The mucous membranes participate in the disorder; the lips and tongue are often a bright red, the papillæ of the latter being prominent and the former covered with a yellowish superficial crust. Gingivitis and dental caries are almost the rule, but true pyorrhœa is not common. Chronic naso-pharyngeal catarrh is almost invariable, and often associated with the adenoid facies. Every variety of digestive disorder may be found. Fermentative flatulence is one of the commonest. The urine acidity is high. Dr. Barber holds that the essential ætiological factor in producing this state is an alteration in the secretion and composition of the cutaneous fat, which comes to favour the parasitic growth of skin saprophytes. Probably a similar change takes place in the mucous membranes. The disorder is obviously due to some error in the correlation between diet and the expenditure of physical energy. While all of us may be potential seborrhœics, it is possible to escape our fate by the judicious adjustment of diet and exercise

[3] THE LANCET, Feb. 9th, 1929, p. 295.

The normal sebaceous secretion can be altered by the excessive intake of fat or by the ingestion of special forms of fat; excess of carbohydrate and alcohol are known to promote seborrhœa. While admitting adjuvant factors like heredity, age, sexual evolution, and intestinal toxæmia, Dr. Barber maintains that the error of metabolism expressed in the seborrhœic state is to be countered by vigorous out-of-door life with light clothing in a bracing sunny climate.

THE CAUSE OF AURICULAR FIBRILLATION

TWENTY years ago Lewis put the finishing touches to Mackenzie's most important work by proving that "delirium cordis" in the human subject is nothing more nor less than the familiar auricular fibrillation observed in animal experiments. Delirium cordis had long been known to clinicians as a characteristic feature of the later stages of rheumatic heart disease; but, before the investigations of Mackenzie it was generally believed that this peculiar irregularity of the pulse was a result of heart failure. We now know that it is the other way about. It is not the heart failure which leads to fibrillation, but the development of fibrillation which is often the determining factor in precipitating the onset of heart failure. We may now go a step farther and inquire: What is the cause of fibrillation? The answer to that question is considered in a paper by Dr. John Cowan in the current number of the *Quarterly Journal of Medicine*. Cowan points out that there are two types of fibrillation — namely, established and paroxysmal. The former is often associated with definite structural changes in the auricular wall, the result either of an old rheumatic infection or of a degenerative fibrosis. In some cases, however, the auricles are found at autopsy to be devoid of any macroscopic or microscopic evidence of disease. Sometimes, as for example in exophthalmic goitre, the disorder is clearly attributable to a definite toxæmia, and normal rhythm may return when the source of that toxæmia is removed; but at other times one may seek in vain for an adequate exciting cause. This is often true in the paroxysmal type of fibrillation. Between attacks there may be absolutely no evidence of any cardiac defect, the patient appearing to be a perfectly healthy man. As Cowan points out, these paroxysms of fibrillation are frequently associated with flatulence and other digestive disturbances. This he regards as evidence of intoxication from the gastro-intestinal tract; but may there not possibly be an alternative explanation, a reflex disturbance produced through the vegetative nervous system? The innervation of the heart is so closely related to that of the abdominal viscera that it is not difficult to imagine that a disturbance in one part of the vagal field may excite reflexly disorders in more distant organs. It seems probable that many hearts are on the verge of fibrillation, for patients often attribute the onset of their palpitation or distress to some unusual physical effort. Cowan instances spring-cleaning as the provoking cause in one of his patients, and oddly enough it was the wife and not the husband who suffered.

BORIC ACID AS A NATURAL CONSTITUENT OF FOODS.

J. A. Voelcker has shown that boric acid is a necessary ingredient of soils for the growth of many agricultural crops, and E. S. Johnston has come to the conclusion, based on experiments on tomato and potato plants, that boron should be added to the list of elements necessary for plant growth. Boric acid may therefore be expected as a constituent of vegetable food products, and the public analyst and physician alike will want to know to what extent it is naturally present. Two pieces of work reported in the January issue of the *Analyst* are therefore of considerable interest. Mr. A. Scott Dodd, continuing earlier work on the occurrence of boron compounds in cacao products, has examined other fruits and vegetable products. Having regard to the requirements of the Public Health (Preservatives) Regulations, 1925, he has tested certain vegetable products which enter into the composition of cakes, buns, mincemeat, wines, jams, and sauces. He found in currants, raisins, muscatels, and sultanas, both from Empire sources and from Europe and California, an amount of boric acid varying from 0·010 to 0·022 per cent. on the fruit as received, whilst the dry matter contained rather more. In such dried fruits as apricots, dates, cherries, figs, peaches, prunes, pears, and apple-rings, the amounts varied from 0·003 to 0·025 per cent., of the same order as the dried grapes already mentioned. It is worthy of note that the amounts seem to be specific to the species examined. For example, Australian apricots contained 0·022 and Californian 0·023 per cent.; Australian and Californian peaches contained, respectively, 0·025 and 0·022 per cent.; whilst two samples of French and one of Californian prunes all contained 0·003 per cent. Black and red currants, cherries, gooseberries, cranberries, and tomatoes in the fresh condition contained from 0·003 to 0·006 per cent., varying from 0·03 in the dry matter of black currants to 0·109 in that of tomatoes. The large quantity found in the dry matter of tomatoes is interesting in view of Johnston's work on these fruits, but it does not amount to much on the fresh fruit. Minute amounts of boric acid have been found by A. Hebebrand in the juice of oranges and lemons, whilst the Government chemist found mere traces in the edible portions of the fruit. J. T. Dunn and H. C. L. Bloxham found in the peel of oranges from California, the West Indies, and South Africa, from 0·005 to 0·033 per cent of boric acid, and from 0·002 to 0·008 in the pulp. Wines have been found to contain less than 0·01 per cent. It does not appear that any food product in a state adapted for consumption would be at all likely to contain an amount of boric acid approaching what would be added in order to act as a preservative. An analyst would be ill-advised in reporting as added amounts of boric acid less than 1 grain per lb. (0·014 per cent.).

RECENT WORK ON LEPROSY.

ALTHOUGH there can be little doubt that leprosy is infectious, not much is accurately known about the way in which it is transferred or how the organisms enter the body. In a recent paper [1] E. B. Vedder points out that whilst the disease is often familial, close contact does not necessarily favour its spread. Married couples, one of whom is leprous, have lived in intimate relationship as long as ten years without the infection being conveyed and, under experimental conditions, it has been by no means easy to transmit leprosy from one person to another. Thus, between 1844 and 1858, Danielssen repeatedly inoculated himself and other volunteers, numbering 20 in all, with material obtained from leprous nodules and did not get a single positive result. The question of age-susceptibility, which is referred to by an American correspondent on p. 412 of our present issue, is not yet fully understood, but in the Philippines it has been calculated that close and intimate association with a leper for at least two years is required for the transmission of leprosy even to children. The occasional incidence of the disease amongst Europeans who appear to have had no contact, however casual, with lepers, has with other considerations suggested the possibility of transmission by insects, and Vedder records that a study of its epidemiology in the Philippines has been undertaken in the hope that further light might be shed upon the problem. The resultant figures seem, however, to show that some local condition other than contiguity or density of population is the most important factor influencing the spread of leprosy. Under experimental conditions a number of mosquitoes (*Aëdes ægypti*), which

[1] Philippine Jour. of Sci., 1928, xxxvii., 215.

had fed on lepra-infected skin were examined, and undoubted lepra bacilli were found in 41 per cent. of them. They were recognised as lepra bacilli, not only because they were acid-fast, but because of their characteristic grouping. Courageous transmission experiments were made upon three volunteers secured from Bilibid Prison. All were young men in perfect health. The first was inoculated intradermally on March 29th, 1927, with material from a leper tubercle, but up to June, 1928, none of the signs characteristic of leprosy had developed. The remaining two were subjected to the bites of large numbers of *A. ægypti* with ingested lepra bacilli, but up to the time of writing these victims also had remained free of leprosy.

In connexion with the treatment of leprosy it may be noted that Olpp [2] of Tübingen, has been trying the effects of giving potassium iodide by the intravenous route, and states that the clinical improvement in six weeks was equal to what might be expected after a year's treatment with the chaulmoogra derivatives. Several reactions in the leprous lesions were encountered and can be classified, he says, under four headings—local reaction in already existent lesions; bacillæmia; the appearance of fresh minute leprous lesions in the skin; and a rise of body temperature in proportion to the nature of the lesions. In nodular leprosy, or in leprous involvement of the skin, the initial dose of potassium iodide is 0·06 g., but this dose is daily increased by 0·06 g. till such a time as a reaction sets in. In nerve leprosy, or the anæsthesic forms, the initial dose is 0·3 g., increasing by the same amount daily up to 1·8 g., or until a reaction sets in. During treatment the body temperature should be taken at least four times daily. The increased sedimentation-rate of the red blood corpuscles and the appearance of a definite leucocytosis are both indications of the favourable reaction of potassium iodide. Undoubtedly the potassium iodide method introduced by Muir has already achieved remarkable success, and its ultimate consequences cannot as yet be accurately foreseen.

NEUROLOGICAL PROBLEMS CONNECTED WITH LABOUR.

THREE papers bearing on the immediate and remote effects of intracranial birth injury, written from somewhat different standpoints, may be found in the *Journal of the American Medical Association* for Jan. 12th. Prof. H. Ehrenfest attempts to answer the question "Can intracranial birth injuries be avoided?" He considers that some degree of trauma to the nervous system, probably in the form of contusion of the brain, is so common as to be properly regarded as physiological, and that minimal lesions of this kind are unlikely to produce lasting effects. The liability of the human infant to this form of trauma is attributable to the presence of fontanelles and sutures; in control experiments on new-born mammals with thick skull bones and no fontanelles they were never observed. The truly pathological lesions of the brain (gross hæmorrhage) are caused in two principal ways: (1) distortion or compression of venous sinuses, and abnormal stresses exerted on the dural septa; and (2) the "suction effect" described by P. Schwartz—i.e., the difference between the intra-uterine pressure after rupture of the membranes and the atmospheric pressure to which the presenting part is subjected after dilatation of the os. Trauma of the first type is undoubtedly possible when pressure of any kind is applied with undue rapidity. Prof. Ehrenfest recommends as a prophylactic measure "absolute non-intervention during labour that is progressing normally, excepting in this respect an episiotomy and truly perineal forceps applied to a maximally compressed head." He considers that by this policy the "physiological" trauma may be reduced to its possible minimum; he also suggests that harm may be avoided if every infant which shows signs of asphyxia is regarded as probably suffering from intracranial trauma, and is not subjected to any vigorous measures of resuscitation.

Dr. Bronson Crothers discussed the mechanism of labour from the point of view of the neurologist. He reminds the reader that the hemispheres have little or no function in the new-born, and that the viability of the infant depends on the integrity of the tissue lying between the tentorium and the upper part of the cord. This area is protected from direct injury by the relatively rigid base of the skull and the muscles of the neck; it is also guarded by the tentorium from pressure transmitted from above. The supratentorial portion of the brain, however, is protected by far less rigid bony walls and is subjected to the alterations of form and pressure occasioned by moulding. Considerable distortion of this area may occur without producing effects which are immediately dangerous to life. On the other hand, should any sudden increase of stress cause a rupture of the tentorium an injury will result which is usually fatal, either from hæmorrhage or from the pressure exerted upon the bulbar centres. Dr. Crothers is in agreement with Prof. Ehrenfest that forceful measures of interference are likely to increase the dangers of fatal cerebral hæmorrhage. But he speaks also of the other side of the question, which does seem to present something of a dilemma; for undue delay in delivery also has its dangers in that it favours the occurrence of the "suction-bleeding" already referred to, the effects of which are less evident to the obstetrician but are afterwards of concern to the neurologist. Dr. Crothers further draws attention to the dangers of traction on the breech, and to the lesions of the cord which this unphysiological procedure may produce.

Dr. P. L. Schoeder has investigated the possible relation between birth injury and "behaviour difficulties" in childhood. He gives details of two groups of children, one showing evidence of infantile cerebral palsy, and one in which a history of cerebral birth injury was obtained. The traits included under "behaviour difficulties" are so varied and so numerous that his cases are not always clearly distinguished from the normal. A good deal of retardation was found in both groups, and Schoeder attributes their behaviour difficulties to a large extent to this factor, the difference in behaviour between the groups being accounted for by "orthopædic handicap." He infers, on evidence which seems by no means conclusive, that "distractability and hyperactivity" should be added to the classification of the results of birth trauma. Before subscribing to this opinion we should wish to investigate and compare the incidence of these extremely common characteristics of childhood in children who do not show a history of cerebral trauma.

[2] Münch. med. Woch., Jan. 4th, 1929, p. 13.

PROF. JEAN SICARD.

Jean Sicard, whose sudden death occurred at his home in Paris a few days ago, has been called by Prof. Dumas the "Healer of Pain." His title to this description depends on his researches into the mechanism of pain at a period when little distinction was made between various forms of pain, and treatment was correspondingly empirical. To neuralgism he gave a sympathetic origin, and secondary neuralgias he traced to their respective sources, trying to evolve a rational and differential system of ætiological treatment. Sympathetic neuralgism he treated with heat and X rays, secondary neuralgias by operative or other means, and "douleurs essentielles" by local means—destruction of sensory nerves, and so forth. From 1899 onwards he devoted much of his time and energies to investigation into the properties of the cerebro-spinal fluid, correlating them with various morbid conditions of the central nervous system. But the sphere in which he was most widely known, and the pioneer work with which his name will always be most intimately associated, concerns his diagnostic

injections of lipiodol. His investigations in this field began with the observation that skiagrams of different parts of the body into which this substance had been injected showed it to be impermeable to X rays. He exploited his observation as a means of demonstrating lesions in almost every part of the body, but it was the nervous system in particular that he illuminated by this device, demonstrating the exact position of lesions which had given rise to signs of compression. While making injections of luargol, he noticed that it clotted blood in the veins, and from this isolated observation he was led to devising treatment of varicose veins by means of intravenous injections of various drugs, first luargol, later sodium carbonate, and finally sodium salicylate, the employment of which in the injection treatment of varicose veins is still advocated by many. These examples of Sicard's work should suffice to show what manner of intellect he possessed. Apparently small things which the crowd overlooks were not only carefully noted, but were also applied to the solution of difficult problems, being made the starting-point of new ventures and discoveries. He would pick up an old key in the gutter, polish it, and then pop it into the keyhole of the nearest locked door, thinking it might peradventure open it. And when it happened to do so, and he found great store of treasure therein, he was quick to put it in order, to tidy and classify it, and then to give it to all the world with open hands. It is a pity that the taste for picking up keys in the gutter is only congenital and not to be acquired by laboured conscientiousness.

MEDICAL EDUCATION IN THE SOVIET UNION.

WITH all its reputed disadvantages, Soviet government seems to have brought about great development of the study of medicine in Russia. According to a recent article by Dr. Nikolai Messis,[1] medical study before the Revolution was handicapped by many political restrictions. There were only eight Government schools, which excluded women and restricted Jews to a quota of 3 per cent.; seven private institutions were in existence. As soon as the Czarist Government was overthrown, the State schools were overwhelmed with applicants, and by 1924 the number of students reached 47,000 and the number of schools had been increased to 30. The supply of qualified men and women soon exceeded the demand, which is for not quite 25,000, and the Government have restricted the number of new entries by imposing certain conditions of selection. Applicants from the working classes are given preference, and bursaries have been founded to assist them; the number of these in 1924 was 8671 in Russia alone, not counting the other autonomous Soviet States. Other bursaries are maintained by the various industrial organisations for their own members. The schools are administered by faculties elected by the staff and the students, which latter are represented upon the governing body and the subcommittees which have charge of the various departments and provide a certain number of the members of the executive committee—half the number representing the teaching staff. The executive committee also contains representatives of the Government and the trade-unions, and the medical committee representatives of the unions of the medical personnel. The schools as a whole come under the Peoples' Commissary for Education, who is assisted by a scientific committee. The course, fixed in 1924, lasts five years and aims at restricting the preparatory studies in anatomy and physiology as much as possible. They are to be completed in two years, and the remaining three are devoted to medicine proper; the syllabus lays great stress on the necessity for introducing the student at once to the practical work of the laboratory and clinic. There are two post-graduate schools, one at Leningrad and the other at Kasan, on the Volga, while post-graduate and specialist courses are provided at many other clinics. In the year 1926–27 these attracted no less than 2716 doctors. The courses include a study of the work of the special clinics for tuberculosis, venereal disease, maternal and child welfare, orthopædics, and physically and mentally defective children—institutions which have multiplied with great rapidity under the Soviet.

[1] Schweiz. Med. Woch., 1928, xlviii., 1189.

SPURIOUS PRECISION.

THOSE with any critical knowledge of chemistry must be filled with amazement at the varied ways of stating the results of mineral-water analyses and the precision which is sometimes claimed. It is, for example, startling to see that the water from a "source thermale" in Luxembourg contains in 1 kg. 15·433434 g. of solids, of which 9·4148 g. is sodium chloride, and 0·45487 g. is hydrocarbonate of magnesium; more especially when one reflects that Stas, at the not far-distant University of Louvain, did not achieve such accuracy in his classical determination of atomic weights. At its last meeting, the International Society of Medical Hydrology adopted certain resolutions[1] which should clear up some of these points. Among other things, it is recommended: that the analysis of a water shall always be expressed in terms of ions, whether its interpretation in other terms is given or not; that the quantities of ions, also "salines" when given, shall be given to one decimal place only, or when the quantity is less than ten, to two significant figures; and that the analysis shall be in terms of parts per million, either as mg. per litre or mg. per kg. It is hoped that international standard measurements may be used in the publications of spas and in national handbooks, and in this and other ways the recommendations should simplify the task of the physician who has to compare different waters. It is by no means easy to convert grains per pint into parts per 100,000 or cubic inches of gas per gallon into millilitres per litre.

A MEDICAL COUNCIL FOR INDIA.

IT has long been apparent that the provincial medical councils, useful as they have proved in many respects, have not been capable of dealing satisfactorily with some questions affecting India as a whole, and the renewal of proposals to establish a council for the whole of India, which have twice been put forward during the last eight years, comes as no surprise. The text of the Bill to effect this object which is at present under consideration is in some respects still being treated as confidential, but the general tenour of the proposals is known, and they are discussed in the January number of the *Indian Medical Gazette*. The functions of the provincial medical councils are the maintenance of medical registers, with corresponding disciplinary powers, and authority to require particulars of the examinations of institutions included in their schedules, and to depute visiting members to be present at such examinations. These functions have, no doubt, been satisfactorily fulfilled, on the whole, but the time has now come when a central body for India is urgently needed, in order to obtain uniformity in the educational standards of the various provinces, and also to negotiate with British, colonial, and foreign licensing bodies, or other authorities, concerning proposals for reciprocity and other matters. For some time past, as is generally known, difficulties have arisen periodically with regard to the recognition of certain Indian medical degrees, and it is an open secret that representations from the British General Medical Council with regard to the desirability of instituting some more centrally responsible authority than at present exists have been instrumental in bringing up the subject again with increased urgency. Its consideration was at first complicated by the fact that there is not only the graduate class to be considered—the class, that is, which is generally eligible

[1] Archives of Medical Hydrology, January, 1929, p. 153.

for registration in Britain—but also the non-graduate or licentiate class, which is not educated on the same lines, and cannot aspire to such recognition. The present governmental proposals evade this difficulty by dropping the licentiates and confining themselves to the graduates. No doubt this is convenient, and it may be necessary for the time, in order to avoid delay, but it is to be hoped that the licentiates also may eventually be brought into the orbit of the central council. It is, in fact, the licentiate class which is most in need of regularisation. The diplomas of the various provinces vary to a much greater extent than the degrees, and one of the most useful functions of an all-India council would be to correct these discrepancies. If the present proposals are approved, the powers of the provincial councils with regard to the graduate class will pass to the central body, leaving the provincial councils to deal with the licentiates alone. The *Gazette* suggests, however, that as regards disciplinary work it would seem more convenient that for graduates as well as licentiates, action should first be taken by the provincial councils, appeals being allowed to the central council if desired. The difficulty of hearing disciplinary cases from the whole of India in one central locality would certainly be great, and this suggestion is worthy of note.

Subject to any modifications which are found necessary, we may agree with our contemporary that there can hardly be any reasonable grounds on which objection can be taken to the objects of the Bill, and that the establishment of a central medical council for the whole of India would not only mark a great advance in the organisation of medical education, but would place the Indian Empire in a much better position to negotiate with the outside world on questions such as the mutual recognition of qualifications and other matters of medical policy.

THE VARICOSE ULCER.

FROM all sides observers are sending in accounts of their experiences with the injection treatment in the obliteration of varicose veins. This treatment is so simple, so effective, that it has ousted almost completely the treatment by operation. It is not applicable to every case, and it is open to argument that where Trendelenburg's sign is positive it may be well to tie the internal saphenous vein besides injecting it lower down. But, on the whole, it can be said that the injection methods now generally adopted are suitable for routine use. The risk is less than operation and the results are better. When the veins have been obliterated there remain the varicose ulcers to consider in many cases. In a recent Hunterian lecture at the Royal College of Surgeons of England, Mr. R. T. Payne recorded his observations on the healing of these ulcers after injection treatment. Among patients at St. Bartholomew's Hospital he obtained striking success; when thrombosis was achieved, 87 per cent. of the ulcers healed so as to allow the patients to carry on their usual occupations. In the other 13 per cent. there was very great improvement. How rapidly healing will be brought about seems to depend more than anything else on the depth to which the ulcer has penetrated, and particularly on the participation of the underlying bone in the inflammatory process. Mr. Payne finds that a prognosis can be based upon skiagraphic findings; the greater the changes in the underlying bone the greater the difficulty in bringing about a cure. In the patients who were cured no particular local treatment was given beyond washing the surface with boiled water, applying a calamine lotion, and cleaning up the ulcer with ether at the weekly visit to hospital. These results clearly indicate that the paramount factor in the persistence of varicose ulcers is interference with venous drainage. There are more ways than one of influencing the circulation of the lower limb and bringing about a cure; the method of Prof. R. Leriche is to tie the internal saphenous vein, sever the sympathetic sheath of the femoral artery, and excise the base of the ulcer. After an interval skin is grafted on the base of the ulcer. The sympathectomy not only improves nutrition of the part but leads to a sterilisation of the surface of the ulcer. By this means he has caused ulcers to heal which have lasted for very many years. It seems that we now have methods of curing these very intractable affections, the first choice being a trial of injection. Should this fail resort might be had to Leriche's method, which requires a period of hospitalisation.

PAUL UNNA.

WITH the death of Unna, in his seventy-ninth year, there passes the last of a long series of German and Austrian dermatologists that began with Hebra and Kaposi, and produced such geniuses as Neisser. He had lived so long that his name had become a tradition—a tradition which will last as long in dermatology as the name of Richard Wagner in music. Between these two men there are other resemblances which render a comparison interesting. Both were highly original, and followed no paths but of their own making. Their work and opinions were unconventional, and both were thus in conflict with the spirit of their times. In each case the result was a certain professional isolation, or at least the none too popular foundation of a cult—the one at Bayreuth and the other at Hamburg, where it was not until 1919, when he was 69, that Unna was granted for the first time the title of full university professor. Judged by the standard and importance of his contributions to dermatology, the honour must have been long overdue, and there can be no doubt that he was a great teacher and efficient therapeutist, for students and patients flocked to his private clinic from all parts of the world. The founder and for many years the most regular and important contributor to the now flourishing *Dermatologische Wochenschrift*, there was no branch of dermatology outside his knowledge or the diligence of his microscope and pen. Three great works punctuated an even flow of minor contributions—namely, Contributions to the Histology and Development of the Human Skin and its Appendages [1] (1876); the Histopathology of the Skin (1894); and the Histo-chemistry (Histochemie) of the Skin (1927). He published a book on cutaneous therapy, and in coöperation with the well-known firm of Beiersdorf, invented a new technique for the treatment of localised dermatoses and tumours by incorporating therapeutic ingredients in standardised proportions in adhesive plasters and plaster-mulls. The closing years of his life were unattended by the usual clouding of mental and bodily vigour, and during these years he received the recognition of his fellow countrymen. To hear him respond to the toast of "the Father of Dermatology" at the Dermatological Congress of Bonn in 1927 was to see him honoured as he always deserved, a notable pioneer and leader in an increasingly important branch of the healing art.

[1] Archiv. f. Mikrosk. Anat., 1876, xii.

DONATIONS AND BEQUESTS.—Mrs. Margaretta Hill, Bexhill-on-Sea, left bequests including £1000 towards the fund for building and endowing a hospital at Bexhill, £150 each to Queen Mary's Hospital for the East End, Stratford, and the Woodford Jubilee Hospital, and £100 to the South London Institution for the Blind.—Mr. Joseph Pugsley, of Edney's Mount, Staplehill, Bristol, left £1000 each to the Bristol Infirmary and the Bristol General Hospital, and £300 each to Bristol Royal Hospital for Sick Children, Muller's Orphanage, Ashley Down, and Bristol Eye Hospital.—Mr. Charles Montague Fox, of Brentford, left a sum sufficient to endow a bed in St. Mary's Hospital, Paddington.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

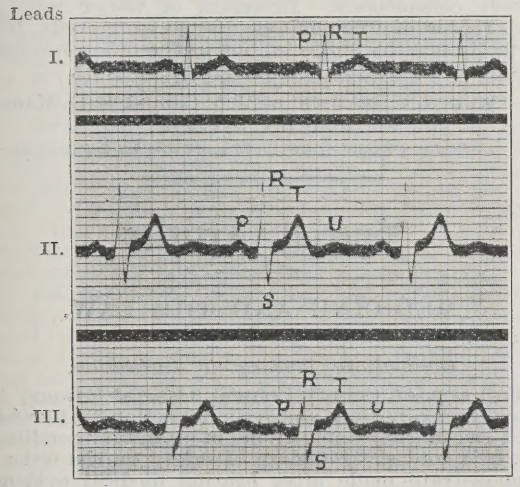
XXIII.—THE ELECTROCARDIOGRAM.

PART I.*—NORMAL RECORDS.

The Value of Electrocardiography.

THE busy practitioner who has little time for specialised reading is often at a loss to know what kind of phenomena the electrocardiograph records, and when it is likely to furnish information helpful to him in his practice. His difficulty may lie in understanding the physical principles on which the method is based. Whereas a tracing of the arterial or venous pulse is merely a graphic representation of something he can feel or see, the electrical phenomena accompanying the heart beat are less familiar to him, for they cannot be appreciated by the unaided senses.

FIG. 1.



Record showing normal differences in the three leads. (3 m.v. = 2 cm.)
Electrocardiograms are generally calibrated so that an electromotive force (E.M.F.) of 3 millivolts gives a deflexion of 3 cm. when the camera is placed at a distance of 1 metre from the galvanometer. The author prefers to take them with the camera nearer to the galvanometer, so that 3 m.v. gives a deflexion of only 2 cm. with the string at the same sensitivity. This makes it possible to get a larger number of cycles on a single plate and at the same time to preserve the normal relative proportions of the curve. Provided the calibration is stated, its actual value is immaterial.
The horizontal lines are 1 mm. apart.
The vertical time lines in the plate are separated by intervals of 0·2 and 0·04 sec. respectively.

Even the general physician is not always clear about the scope and limitations of the subject. Impressed by the fact that in its early days clinical electrocardiography was of value in distinguishing the different types of irregular heart action, and knowing that these can now generally be recognised without its aid, he is apt to think that the method has outlived its usefulness. He does not realise that, when he first began to use the electrocardiogram to detect auricular fibrillation, those who were making a special study of the subject had already passed on. Having charted and signposted the arrhythmias, they were then exploring new ground. They were investigating disorders of the cardiac function in which the regular rhythm of the heart was undisturbed. They were becoming acquainted with the modifications in the electrocardiogram produced by degenerative processes in the walls of the ventricles, by coronary thrombosis, and by the action of digitalis and other drugs. Even now there are many abnormalities of the electrocardiogram the significance of which is still obscure, and there is reason to hope that some of these may prove to be the clues to clinical problems yet unsolved.

FIG. 2.

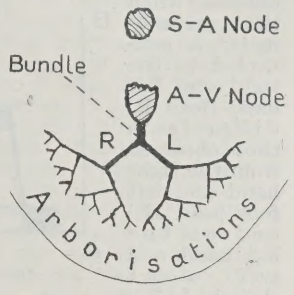
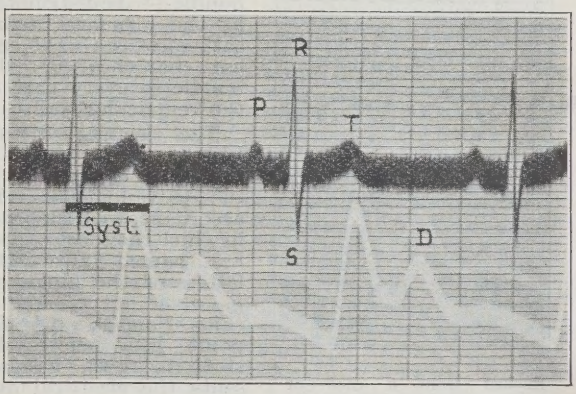


Diagram of nodes and bundle. R and L = right and left branches of bundle.

In the preface to the fourth edition of his "Clinical Electrocardiography" published only a few months ago, Sir Thomas Lewis says: "Cases of structural heart disease are few in which an electrical examination is superfluous, and in not an inconsiderable percentage of cases the records modify, more or less profoundly, our conceptions of the malady that we treat." The value of the method as an aid to diagnosis requires no further emphasis; but there is another aspect of the subject which is perhaps less obvious. The careful physician never fails to profit by the opportunity of verifying his clinical findings at autopsy; for he realises how much he has to learn from his mistakes. Fortunately for the patient, recovery frequently robs him of this check. Not so with the pathology of the living heart; for when the electrocardiograph is available it can often supply the information we require. By enabling us to detect errors in clinical diagnosis which otherwise would pass unnoticed, it sharpens the faculty of observation, and at the same time serves to remind us of our limitations.

In many derangements of the cardiac mechanism electrocardiography enables us to see clearly what is happening and to follow step by step the development of a disturbance of function, where, without its aid, the end-results alone would be apparent; it permits us in fact a glimpse behind the veil which cloaks the fundamental processes of disease. Thus, in the interests of the patient, additional facts concerning his particular case may be brought to light, while the physician has a ready means of checking and supplementing his clinical observations. Like the quality of mercy the electrocardiogram "is twice blest; it blesseth him that gives and him that takes."

FIG. 3.



Synchronous electrocardiogram and radial sphygmogram to illustrate time relations of ventricular systole (syst.). (3 m.v. = 3 cm.). D = Dicrotic wave.

The Normal Record.

By placing on the surface of the exposed heart a pair of electrodes, connected to a rapidly moving galvanometer, sudden changes of electrical potential

* Part II., Abnormal Records, will appear next week.

accompanying each heart-beat can be demonstrated. For clinical purposes it is obviously impracticable to place electrodes directly in contact with the patient's heart; but since the currents produced within the heart spread to all parts of the body, their presence can be made manifest by connecting the galvanometer leads to the hand and foot. The curves (Fig. 1) obtained when the galvanometer is connected to the right and left hand (lead I.) differ from those obtained from the right hand and left foot (lead II.) or from the left hand and left foot (lead III.). This is due to the fact that the electrodes in these three leads are disposed in different planes; hence one lead is more favourably situated to record one phase and another another phase of the electrical disturbance. For this reason it is always desirable to study the electrocardiogram in more than one lead, remembering that lead III. exhibits the greatest variation in normal subjects.

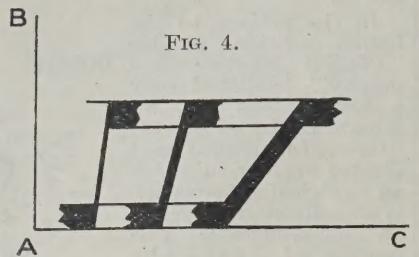
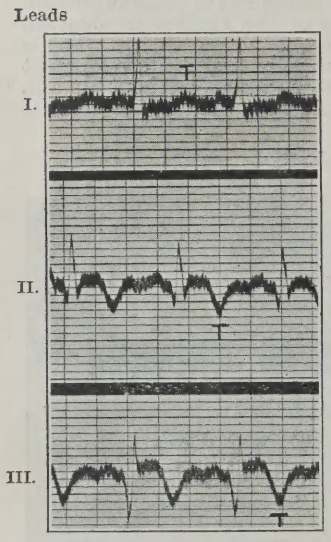


FIG. 4.

A–B, differences of electrical potential; A–C, time.

The electrical disturbance associated with cardiac contraction first makes its appearance in a localised collection of specialised tissue in the wall of the right auricle, known as the sino-auricular node (Fig. 2). Thence it spreads, like a ripple on a still sheet of water, over the musculature of the auricles, and eventually reaches a second collection of specialised tissue known as the auriculo-ventricular node. Leaving the A-V node the excitation wave enters a special conducting strand—the auriculo-ventricular bundle—to be distributed by the ultimate ramifications of the right and left branches of the bundle to every part of the ventricular wall.

FIG. 5.



Record from a case of coronary thrombosis, showing large inverted T in leads II. and III. (3 m.v. = 2 cm.).
The very rapid small oscillations, which are especially pronounced in lead I., are due to tremor of the somatic muscles.

The electrical disturbance gives rise to a series of deflexions in the galvanometer. In accordance with the order in which they occur, these are named after the letters of the alphabet. P, Q, R, S, T, and U (Figs. 1 and 3. Q is the point just before the steep rise to R). P represents the electrical disturbance associated with auricular systole, Q, R, and S the rapid changes of potential as the excitation wave spreads quickly through the A-V bundle and its branches, and T the more gradual subsidence of the state of excitation in the ventricle. U is an inconstant feature the significance of which has not yet been determined. Normally throughout the interval between S and T the galvanometer remains at rest in the zero position, since the whole mass of the ventricular muscle is in a state of excitation, and its different parts are all at the same electrical potential.

The varying thickness of the lines in different parts of the record sometimes puzzles those who are unfamiliar with graphic records. The explanation is very simple. The ordinates (A–B, Fig. 4) represent differences of electrical potential, whilst the abscissæ (A–C) represent time. The greater the vertical displacement in a given horizontal distance, the thinner the line.

The electrocardiogram is more personal than most graphic records. In the same individual, in health, its features remain remarkably constant; whereas it is rare to find two records from different subjects which are exactly alike. There are, however, certain points of similarity which enable us to differentiate the normal from the pathological, and in reading an electrocardiogram the principal features which demand attention are the direction, amplitude, duration, and time relations of the different deflexions.

In normal records the amplitude of the R wave appears to be related to the condition of the ventricular muscle. It tends to increase during convalescence from an acute illness and to diminish after a prolonged and severe physical effort. R waves of very large amplitude are frequently found in records from excitable overacting hearts, as in the case of patients suffering from exophthalmic goitre. Similarly in electrocardiograms from normal people the T wave is always conspicuous. Inversion of the T wave in lead III. is of frequent occurrence in records from perfectly healthy subjects, but in the other two leads it is generally regarded as abnormal (Fig. 5).

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Assistant Physician to the Manchester Royal Infirmary.

Special Articles.

MEDICINE AND THE LAW.

Compulsory Removal to Institution.

THE London County Council (General Powers) Act of last year contained a provision (Section 28) by which aged and infirm persons living in insanitary conditions can be removed to a place of safety on the order of a magistrate made after hearing medical evidence. What is stated to be the first order made under this power in London was made last week in the case of a woman of 77, an old-age pensioner, whose condition of living, surroundings, and need of skilled care and nursing were described in evidence by Dr. F. L. Keith, the medical officer, on an application on behalf of the Bethnal Green Borough Council. The new statutory power is a development of the power to compel removal to hospital of persons suffering from grave infectious disorder; similar clauses are to be found in the Sheffield Act of last year (Section 160), the Rotherham Act of last year (Section 101), and the Leeds Act of 1927 (Section 95). The general procedure has affinities with the machinery for certification and detention order under the Lunacy Act. Presumably no aged and infirm persons will bring actions for damages against a medical practitioner for alleged negligence in certifying them to need skilled care and nursing, and to require removal to an institution. As in the case of the Lunacy Act procedure it is the magistrate's order, and not the medical witness's evidence, which deprives the patient of liberty.

Imprisonment for Bogus Doctor.

Though causing a certain inconvenience to registered practitioners, the Dangerous Drugs Acts are proving a positive check to the unregistered. A man who admitted to the police that he possessed no degrees under the General Medical Council, and who pleaded guilty at Wallasey last week to charges of obtaining money by false pretences, was able to pose as a doctor and to prescribe drugs for patients with impunity until he included elixir heroin in his range

of drugs. The chemist informed him that it was a dangerous drug and that a prescription must be given for it, together with information of the name of the patient. The accused, who had been in the habit of marking prescriptions "W. H. Rankin, M.D.," wrote a name on a slip of paper and spelt the word heroin wrongly. This aroused suspicions, the police were communicated with, and they found the pretended doctor attending a patient at New Brighton. He was sentenced at Wallasey to 12 months' imprisonment with hard labour. It was stated that he was known by nearly all the police throughout the country. Here, therefore, the Dangerous Drugs Acts are the public's only safeguard.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Locum Tenent's Fees in the Dispensary Medical Service.

THERE has long been discontent in the Irish dispensary medical service over the rate of payment offered by boards of health to temporary medical officers. A locum tenens was engaged in a hurry, and unless he had an agreement with the board of health as to the amount of his fees he was likely to find himself put off with any sum the board thought fit to offer. It is, therefore, with some relief that medical men who are in the habit of performing temporary duty in the medical service have learned of the order recently issued by the Department of Local Government and Public Health to the Westmeath County Board of Health. Some time ago, in face of a demand from the medical profession of the county for remuneration at the rate of six guineas a week, the board passed a resolution that the rate should be four guineas. The department has directed that certain medical practitioners to whom fees were owing should be paid at the rate of five guineas a week, and that in future at least five guineas is to be paid for temporary duty in any full-sized dispensary district. The Minister added that he would not concur in any lower rate of payment. That the department does not intend to establish the rate of five guineas as a fixed standard is shown by the use of the words "at least," and by its direction to the Wexford Board of Health recently to pay at the rate of six guineas, that being the accepted scale in that county.

Resignation of Colonel Higgins.

It was announced last week that Colonel Thomas Higgins, who has been head of the medical service of the Irish Free State Army since 1923, has resigned his post. Colonel Higgins accepted command of the medical service shortly after the civil war ceased in Ireland, and on him fell the responsibility of organising the service on a peace basis. He tackled the various problems that arose with much ability, and his resignation is a distinct loss. It is announced that he has been selected as the Government Party candidate for the by-election for the Dáil which is shortly to take place in North Dublin. Colonel Higgins is a brother of the late Mr. Kevin O'Higgins. Before joining the Irish Free State Army Medical Service he had experience as a dispensary medical officer in the Midlands of Ireland, and as an officer in the Royal Army Medical Corps.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Change in the Character of Syphilis.

AT the recent meeting of the Interhospital Association Prof. Arthur Sarbó stated that syphilis is treated at present much more effectively than in former times; this is proved by the fact that reinfection is much more frequent. It is accepted that inadequate salvarsan treatment stimulates the spirochætes; this explains a recent observation that the incubation period of general paralysis has become much shorter. Owing to unsatisfactory treatment many neuroplegic cases used to occur. This circumstance induced Prof. Finger, the renowned venerologist of the Vienna University, to attempt to bring salvarsan treatment into disrepute. The character of syphilis has also changed in tropical regions since civilisation has reached them; the best proof of this is the relative scarcity of skin and bone lues. Under the influence of treatment it is probable that the life-history of the spirochætes also undergoes a change and that they hide themselves in the adventitia of the blood-vessels, where the soil is most favourable. Thence they may get into the various organs, through the blood, and multiply there, when the resistance of their hosts begins to weaken. In aged persons the incubation stage is shorter than in younger subjects, the reason being their diminished resistance and general debility. That spirochætes produce symptoms in the nervous system sooner than in other organs, Prof. Sarbó holds, is due to the fact that even the smallest lesion in the nervous system is liable to cause manifestations. Moreover, though the liver and kidneys are very sensitive to spirochætes, lesions in these regions are not easy to diagnose, since the healthy portions of these glands can take on the work of the destroyed parts, so that the pathological process is not detected.

Acoustic Apparatus.

Dr. Verzár, a lecturer in the University of Budapest, has recently reviewed the different types of acoustic apparatus and has set out their functions and defects. These devices serve two purposes: (1) to check loss of sound energy, and (2) to increase resonance by the use of (*a*) drums and (*b*) microphones and telephones. The earliest artificial aids to hearing (the ear tubes) were constructed in order to conserve sound. They were flexible, fairly hard tubes, about 2 metres long, with mouthpieces at one end and earpieces at the other. With the aid of this appliance the patient was able to hear the voice of a speaker 2 metres away as if the latter were speaking right into his ear. The appliance does not alter the character of the voice, and is free from adventitious noises. Its disadvantage, apart from its conspicuousness, is that it is suitable only for a dialogue. Much greater is the sphere of usefulness of ear-trumpets provided with resonating drums. Of this type are the constructions made of ebonite, metal, wood, or other materials in the form of pipes or bells, with a hollow mouthpiece leading to a thin tube with an adapter for insertion in the ear; some trumpets are portable in the pocket, being telescopic. The advantage of trumpets is that they can be turned towards the direction of the sound. They receive sound waves coming from a distance of 2–3 metres, and convey these into the ear, amplified 20–30-fold. Moreover, weaker sounds coming from a greater distance also become amplified if the apparatus is tuned to those sounds. The disadvantage of trumpets is that their resonating capacity is not even—certain sounds are made unduly loud at the expense of others, and therefore speech becomes indistinct and colourless. To this defect is added the noise caused by the vibrations peculiar to the particular appliance, which cannot be eliminated, and the conducted noise of the outer world. These circumstances greatly interfere with the serviceableness of this kind of apparatus, which is, moreover, conspicuous, and for this reason alone unpopular. Inconspicuous devices which can be sunk in the hollow behind the ear, or in the external meatus, are for the most part swindles, sold by unscrupulous quacks. As regards the electric appliances, nowadays much advertised, these consist of microphones, dry batteries, and telephones. Owing to the unequal strengthening of the sounds and the long crackling and rattling noises they emit they are no less imperfect than the older forms, their only

advantage being that they are less conspicuous. Dr. Verzár spoke also of artificial ear-drums. Their simplest form is a thin tissue of wadding soaked in paraffin oil. Any doctor, or even the patients themselves, if they have been taught how to do it, can introduce the tissue deeply into the external meatus. Sometimes the effect is surprisingly good, but only in certain cases; these include dry perforation of the ear drum, scarred tympanic membrane, and the presence of a cavity following healing after a radical operation. Unfortunately, these artificial drums may act as foreign bodies and induce inflammation when they have to be removed. They are contra-indicated in all purulent processes, and particularly in cases of cholesteatoma. Whatever service any of these appliances may render, none approaches the method of lip-reading. All patients afflicted with impaired hearing learn this method naturally, and it is taught in all institutions for deaf people.

Jubilee of Prof. Karl Schaffer.

The fortieth anniversary of the scientific activities of Karl Schaffer, professor of neuropathology in the University of Budapest, was celebrated a few days ago. Prof. Lenhossék greeted Prof. Schaffer on behalf of the Hungarian Scientific Academy. He emphasised the prominent talents shown already in his early youth, the first manifestation being his classic work on the horns of Ammon. After 40 years of ceaseless toil Prof. Schaffer shows no sign of exhaustion, and has recently published an excellent treatise on mental diseases and neuropathology, in which he attempts to correlate our present knowledge of neurology, neurohistology, and psychiatry. Prof. Sarbó spoke of the international reputation of Prof. Schaffer and recalled his brilliant lecture on the anatomy of degenerative nerve diseases at the Innsbruck Congress in 1924. Schaffer's pupils have issued a special volume, forming the seventh number of "Hirnpathologische Beiträge," in honour of the occasion. The introductory lines to this work have been contributed by Dr. S. Ramon y Cajal, the well-known Spanish neurologist. On behalf of the professorial board of the Hungarian universities Prof. Preiss paid a tribute to Schaffer's work, recalling their common studies in the pathologico-anatomical institute of Prof. Scheuthauer, of the University of Budapest.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Medical Organisation in the West.

THE States which lie immediately to the east of the Rocky Mountains constitute an enormous geographical area with a small and widely scattered population—just how scattered it is hard for an Englishman to realise until he has driven his car 50 miles or more along a mud or sand road without seeing even a sign of human habitation. In Arizona, where one can see further and see less than anywhere else in this continent, the county medical societies are sometimes limited to three members. To increase the size of the unit by combining counties is impossible; many of them are as far as 150 miles from their nearest neighbour, in one case 200 miles away. Yet among these small societies there are many shining examples of keen intellectual coöperation. Formal papers are rarely presented, but the doctors come together perhaps twice in the month and discuss case-histories that have been previously circulated. In Wyoming there is not one county society that can boast of more than 30 members; yet men will travel 400 and 500 miles to attend a meeting of the State society. A case of malaria diagnosed in one of the Wyoming hospitals recently was enough of a rarity in that region to bring physicians 200 miles to examine the patient and the preparations made from his blood.

Certainly there is no lack of civic consciousness in these great open spaces; witness the progressive programme of the State medical society of Nebraska. They have made themselves responsible for a regular series of lectures on health and medicine in the State normal school. They are also holding exhibits at the annual State Fair which attracts one-third of the whole population of the State. There is a child welfare demonstration, there are illustrated lectures and moving pictures on health subjects, and free medical examinations of the apparently well visitors who ask for them. The people of Nebraska are learning from their doctors the value of practical preventive medicine. One wonders whether the more elaborate medical organisations in the advanced centres of civilisation are achieving more.

Leprosy.

A statistical study of the 34 years' experience of the National Leprosarium at Carville, Louisiana, has produced some interesting results. While the disease sometimes seems almost to have exterminated the families attacked, still, in the majority of cases (64 per cent.), infection has been confined to one member of the family. As a rule, where familial transmission has taken place, the infected individuals have been exposed intimately for a long time. The incubation period also seems to be almost always long; in five cases it was shown fairly conclusively to have been not less than six years. Taking this figure, it is significant to note that the peak of the age-incidence of leprosy occurs at 21 years for males and 19 years for females, since this seems to indicate that puberty is the age of greatest susceptibility to infection. The mortality-rate has gradually decreased in the institution during the 34 years. Less than 20 per cent. of the deaths of the inmates are directly due to leprosy, though more than half of them may be either directly or indirectly ascribed to the disease. The expectation of life is markedly affected when the disease appears in early adult life, but much less affected after middle age. The average age at onset of the disease is just over 30 years. In the seven years since the Federal Government took over the hospital, 28 cases have been paroled as "arrested." Of these only one has relapsed and been readmitted.

Tularæmia.

The importance of tularæmia and its public health interest becomes more apparent from month to month. The incidence of the disease in man has been reported, as stated in a previous letter, from almost all parts of the United States. In a paper read to the last meeting of the American Medical Association, Dr. Francis was able to analyse no less than 679 case reports, including 24 cases that ended in death. While the recognised cases become more numerous, the possible avenues of infection increase at a still greater rate. Not only rabbits but numerous small rodents, game, fowl, and most recently sheep have been found to suffer from the disease. The possibility of human infection is not limited to contact with the bodies of diseased animals. No less than six different insects are listed by the Hygienic Laboratory as vectors of *Bacterium tularense*—two lice, two biting flies, a bug, and a flea. In addition, the common tick of the Rocky Mountain region, *Dermacentor andersoni* Stiles, which carries Rocky Mountain spotted fever, is unquestionably a carrier of tularæmia too. Infection by bites of insects seems to be commoner in the Western States than in the East, probably because the animal reservoir of infection is much greater in the Western States. Dr. Francis, who is recognised as the outstanding authority on tularæmia, recommends that live rabbits shipped from west to east be quarantined for ten days. Rabbits should only be shipped in winter months when *D. andersoni* has left them for its winter quarters in the ground. He suggests that rabbit meat be kept in the refrigerator for 30 days, after which it is believed all *B. tularense* will be killed

The tick is the most important of the vectors. At least 54 cases have been traced with certainty to this agent, and several others with some probability.

Ticks may harbour the infection throughout their lifetime, and pass it on to the next generation in the eggs. Even crushing a tick in the fingers may lead to infection. *D. andersoni* is one of two species that were described until recently under the single name of *D. venustus*. The other species which retains this title is strictly a tick found on sheep in Texas. Specimens of the Rocky Mountain wood tick were forwarded some years ago from Colorado to the British Museum, where they may no doubt now be found. A more extensive knowledge of its geographical distribution in nature seems highly desirable, though in so far as tularæmia is concerned it is probable that any tick which feeds both on man and on the numerous other animals subject to this disease may act as a carrier

Influenza in Alaska.

The influenza epidemic has invaded the isolated hamlets on the coast of Alaska, and the United States coastguard cutter *Unalga* spent the latter half of December in carrying medical aid to the stricken district. At Hoonah they found 74 of the 75 white inhabitants ill with influenza, and of 380 Indians only 30 had escaped. In the next village were 58 invalids without any medical care. Supplies were left at each port of call, until the village of Kate was reached, where the ship anchored and the medical personnel devoted themselves to the care of the inhabitants.

Public Health Services.

INFLUENZA.

APART from London, where the figures given below speak for themselves, the main incidence of the epidemic in this country is still in the north-west, numerous cases being reported from Manchester and Liverpool, as well as other Lancashire towns. Westmorland, Gateshead, Leeds, Bradford, Sheffield, Derby, Kidderminster, Burton-on-Trent, Luton, Dunstable, London, Newport, Cardiff, and Brynmawr are other epidemic centres. The type of disease is stated in general to be mild, but in Leeds and Bradford cases of pneumonia are on the increase. The disease is subsiding in Portsmouth, and the absence of any epidemic is reported from a number of places such as Durham, Boston, Nottingham, Stoke-on-Trent, and Bristol. In the Army the main incidence is in the Eastern, Northern, and Southern Commands; 672 cases were reported for the week ended Feb. 8th, as against 857 in the previous week.

On the Continent of Europe influenza is still increasing, although mild in type, in North-West Germany, Holland, the west of Czecho-Slovakia, and in some parts of Spain, particularly the north-western provinces. Elsewhere it is decreasing.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 9TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 50; scarlet fever, 2276; diphtheria, 1345; enteric fever, 19; pneumonia, 3898 (last week 3511); puerperal fever, 40; puerperal pyrexia, 141; cerebro-spinal fever, 8; acute poliomyelitis, 8; acute polioencephalitis, 4; encephalitis lethargica, 12; dysentery, 15; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

The largest number of cases of pneumonia was reported from London, 689 (last week 513); Chester, 172 (151); Durham, 133 (149); Essex, 136 (123); Lancaster, 1102 (965); Warwick, 132 (125); Yorks West Riding, 292 (292); from which it will be seen that the incidence has not risen nearly as rapidly as in the previous week, and is already diminishing in some large centres.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Feb. 12th–13th was as follows: Small-pox (38 under treatment, 1 under observation); scarlet fever, 1853; diphtheria, 2043; measles, 56; whooping-cough, 886; puerperal fever, 18 (plus 4 babies); encephalitis lethargica, 79; poliomyelitis, 5; "other diseases," 62. At St. Margaret's Hospital there were 10 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 57 (1) from measles, 19 (4) from scarlet fever, 186 (76) from whooping-cough, 62 (12) from diphtheria, 52 (8) from diarrhœa and enteritis under two years, and 987 (331) from influenza. The figures in parentheses are those for London itself.

The number of deaths from influenza during the previous eight weeks was 61, 69, 83, 99, 122, 179, 321, and 652 respectively. The figures for London during the same period being: 9, 9, 15, 18, 34, 39, 77 and 198, from which it is seen that the rate of rise, being still steep in London, is moderating for the rest of the great towns. In the week under review deaths were attributed to influenza in Manchester, 99; Liverpool, 82; Portsmouth, St. Helens, and Leeds each 25; Salford, 19; West Ham, 16; Wallasey, 15; Southampton, 14; Stockport, 12; Leicester, Birkenhead, and Bolton, 11 each. No other great town had as many as 10. Glasgow reported 62 instead of 236 and 184 in the previous weeks. Belfast 52 in place of 105, and Edinburgh 65 during the same week. The three deaths from enteric fever outside London occurred at Hendon, Southend-on-Sea, and Sheffield. Liverpool reported 12 deaths from measles, St. Helens and Sunderland each 7, Cardiff 6, Hull and Newcastle-on-Tyne each 5. Twelve deaths from whooping-cough were reported from West Ham, 10 from Salford, the remaining deaths being scattered over a wide area.

The number of stillbirths registered during the week was 279 (corresponding to a rate of 41 per 1000 births), including 42 in London.

The Services.

ROYAL ARMY MEDICAL CORPS.

Capt. H. J. Bensted to be Maj., and remains secd.

The undermentioned temp. Lts. relinquish their commns.:
D. G. Hamilton and J. M. F. Whitby.

W. A. G. Bell to be temp. Lt.

TERRITORIAL ARMY.

Capt. V. G. Maitland relinquishes his commn. on account of ill-health.

Lt. A. O. Bekenn to be Capt.

H. B. Stallard to be Lt.

INDIAN MEDICAL SERVICE.

Temp. Capt. Piyare Lal Burman relinquishes his temp. commn.

LADY CHICHESTER HOSPITAL.—The last annual report of the Lady Chichester Hospital at Hove, Brighton, for cases of early nervous breakdown, states that the additions and alterations to the hospital have been completed. The hospital now contains 53 beds, which have all been occupied continuously ever since they were available, and in spite of the increased accommodation, the waiting list is always a very long one. This hospital, the first of its kind to be started in the British Isles, came into existence in 1905. It charges up to maintenance rate (£2 17*s.* 9*d.* per week for in-patients), according to the means of the patients, but no one is ever refused because of inability to pay, and many have been taken for nothing. There are two resident medical officers, and in addition to the honorary visiting physicians the hospital has a staff of consultants. The hospital is making an urgent appeal for funds to meet the £2000 overdraft on the building account and to enable it to carry on and extend its activities.

Correspondence.

"Audi alteram partem."

THE SCOTTISH PRODUCTION OF LEARNING.

To the Editor of THE LANCET.

SIR,—In a recent address Prof. E. T. Whittaker, F.R.S., has made an analysis of 432 Fellows of the Royal Society with a view to finding how many of these were strictly Scottish. Of this number he found 47, or about 11 per cent., to be Scottish, the national element being strongest among the older Fellows. Of 86 Fellows who this year were 71 years of age or upwards, 17 were Scottish, a percentage which is nearly twice as great as that found among Fellows of all ages combined. Both quantity and quality were great. Of Fellows born in 1883 or subsequent years, there are between 40 and 50, but to the lecturer's surprise he has been unable to find among these a single Fellow of Scottish birth or education, and he held that the fact needs explanation. He dismissed at once the idea that there had been any falling off in the intellectual power of the Scottish race; his own experience of 17 years as an Edinburgh professor led him to say so. But he was inclined to find the cause in the nature of the education available in Scottish schools for boys of great natural gifts, the leading principle being to produce a high average all round, without making much provision for individual cases. The highly organised Scottish education had, he pointed out, a notably uniform character throughout, in marked distinction to education in England which was much less rigorously organised and presented a great number of different varieties of school and training. Thus in the Scotland of to-day a clever boy was compelled to keep step with the average boy, while in the older Scotland, as in the English schools at present, there was more flexibility. The consequence was, he said, that the English boy coming up as a freshman say, to Oxford or Cambridge at 18 would often know as much of his subject as an honours graduate of a Scottish University and the advantage gained in early years was never lost. The next campaign of reformers in Scottish education must, he thought, be essentially a campaign for greater individual freedom.

Prof. Whittaker's conclusions cannot be lightly set aside. It has all along been a feature of the Scottish Universities that the curriculum was broadly based and aimed at general culture rather than at specialised development. When "options" were established, there followed undoubtedly a confusion of values. But, apart from that, the resources of the Universities were spent mainly in equipment for teaching and not in equipment for research. But within recent years, certainly in the medical section of the Universities, research is assuming greater and greater importance. It has, however, always been an accepted understanding, marked, moreover, in the Arts subjects, that the more distinguished students of the Scottish Universities should aim at the Oxford or Cambridge curriculum, and large numbers of them have always done so, as the records of those Universities show. If the facts for all forms of scholarship, as well as for scientific scholarship, were scrutinised, I feel confident that Prof. Whittaker's proportions would not hold good. In this type of statistics, the conception of nationality is really not very relevant. But it must be allowed that, until recent years, the Scottish equipment for the higher sciences, as well as for the higher learning, has probably not kept pace with the best that has been done in certain Universities of England.

But I seem to see a new cleavage establishing itself even between English seats of learning. In philosophy, for example, London is taking a place that seriously rivals the best that Cambridge and Oxford ever occupied. But looked at internationally as well as nationally, Scotland, I think, continues to contribute her full share to all the higher intellectual studies. Prof. Whittaker's hint, however, deserves to be taken very seriously by the Scottish Universities.

Let me add another point: the brilliance of the Cambridge group of physicists, both past and present, is probably unique in the world. As the great sequence contained the names of Kelvin, Tait, and other Scotsmen, Scotland need not complain. But the challenge to our younger generation will no doubt have its effect. I am, Sir yours faithfully,

Feb. 14th, 1929. W. LESLIE MACKENZIE.

PROPHYLAXIS OF INFLUENZA.

To the Editor of THE LANCET.

SIR,—In spite of the rapid advance of medical science in manifold spheres, pandemics and epidemics of influenza are still exacting a huge toll of lives and money throughout many nations of the world. Until the specific virus or other causative factor is discovered, our only hope of reducing the case-incidence lies in stricter measures of prevention.

In certain infectious diseases such as small-pox the law is empowered to fine anyone who knowingly suffering from the disease, by failing to take reasonable precautions for isolation, endangers the health of others. Similar steps might be taken during influenza epidemics to forbid patients leaving their homes while still in an infectious condition. No age or class is exempt from this disease, while a previous attack gives no protection. With so brief an incubation period as 24–48 hours, and so abrupt an onset, very little time is given for preventive measures to be applied. Keeping fit alone seems in itself an insufficient protection, as strong robust individuals often suffer more severely than the feeble ones. Vaccines have up to now met with very little success, and in any case would be impracticable for universal prophylaxis.

What, then, is our most potent weapon in the prevention of spread of this disease? Compulsory notification and isolation *in bed* of all cases suffering from influenza would soon put an end to direct infection through personal contact at work, in buses, theatres, churches, &c. Where this is impossible, hospitals should be thrown open for the nursing of severe cases of the disease, while public health centres should provide information on the antiseptic treatment of the nose and throat. All offices, factories, and shops should be circularised by the public health department of the locality advising the use of antiseptic gargles and tablets by their employees. Gauze masks impregnated with chemicals, though tried both in this country and America, have not come into general use owing to their unsightliness and the discomfort of wearing them for any considerable period.

I look forward in the near future to the time when no case of influenza will be permitted to wander out of doors until the period of infectivity is safely past.

I am, Sir, yours faithfully,

Penistone, Feb. 17th. ALFRED A. MASSER, M.B., Ch.B.

To the Editor of THE LANCET.

SIR,—I was greatly interested in Dr. Douthwaite's most helpful letter on the treatment of influenza. He gives us two specific—and I think most hopeful—lines of treatment: the use of serum and mercurochrome. I am convinced that the diet he suggests is the right one—fruit and any amount of fluid. Excess of food and solid food undoubtedly push the temperature up and tend to produce complications. My object in writing is to go a step further back—namely, what can we do in preventing patients taking influenza at all? In my opinion we have a most powerful weapon in correct prophylactic inoculation, and I cannot understand why this is not universally employed. The profession as a whole do not seem to have much faith in influenza prevention by vaccines—in my opinion one of the most certain things in medicine. In most cases the results are nothing short of dramatic. May I briefly describe my own experiences.

These experiences are based on my good fortune in the grave epidemic of 1918 in having been in charge of the influenza wards in a large military hospital, where I saw cases innumerable, and on 18 years in a large general practice with much school work. I have therefore had the advantage of seeing a very large number of cases. For ten years I have steadily practised the method of producing immunity by prophylactic inoculation, and I can without hesitation make the following definite statements :—

1. I have not seen a single death in an inoculated subject.
2. I have not seen a single complication in an inoculated subject.
3. I have seen many patients who were martyrs to severe and sometimes dangerous attacks of influenza once or twice yearly ; I have not seen one such case that did not respond to the vaccine used. I can recall one or two cases only where such patients had an attack after inoculation ; but such attacks were so mild and harmless as compared with their previous attacks that they gave no more cause for alarm than a cold in the head might. A little temperature and in two or three days they were perfectly well again.

Now for the other side : I had one failure—or partial failure. This was in a preparatory school of some 60 boys. These had been kept free for several years. On one occasion an uninoculated boy introduced influenza. Some ten of the inoculated cases became infected, but they took it so mildly that it was almost undiagnosable. I afterwards blamed my own technique that they took it at all, as I found I had given this batch half the dose of vaccine I should really have employed. Finally, until 1919, the headmaster of the school, a man of fine physique and excellent health, was subject to two attacks yearly ; these were of a serious nature. I inoculated him in 1919, and, though often exposed to infection, he went for some six years absolutely free. He then, during an epidemic, developed an attack. He was ill for 48 hours with one of the mildest attacks I have ever seen ; in a few days he was about again completely well.

If a patient develops influenza after inoculation—and I warn all patients that this is not impossible—the attack is so mild as to be almost negligible, and complications in my experience are unknown. Nor does post-influenzal debility follow.

I give two inoculations, at an interval of eight days, about the middle of October and again at the beginning of January. I have seen no reactions from this vaccine, which is prepared for me at the bacteriological department of St. John's Hospital, Lewisham, and consists of the following : In each cubic centimetre *B. influenzæ*, 200,000 ; *Micr. catarrhalis*, 250,000 ; pneumococci, 100,000 ; hæmolytic streptococci, 100,000 ; Friedländer's bacillus, 100,000 ; *Staph. pyog. aureus*, 500,000. First dose 0·2 c.cm. ; second dose 0·4, 0·5, or 0·6 c.cm. For extra security three doses may be given—0·2, 0·4, and 0·6 c.cm.

If a few medical men subject to severe attacks of influenza themselves would give this method a trial, I venture to say that prophylactic inoculation would soon become universal. I believe much depends on the vaccine used ; and two courses must be given during the influenza season.

I am, Sir, yours faithfully,

A. GRAHAM-STEWART.

Ulster-place, N.W., Feb. 15th, 1929.

ASTHMA RESEARCH.

To the Editor of THE LANCET.

SIR,—Notwithstanding Mr. Coke's disclaimer in the first paragraph of his letter, his second makes it clear that he does accept Dr. Culpin's and my own contention that he believes that all illness is somewhat disgraceful. I am, however, more interested in his third paragraph, which breaks new ground with its taking "the battle into the enemy's country"—the enemy being the psychotherapist. No doubt he intends a little banter, but at the same time he seems to feel he has scored over "the enemy" by curing a patient, by means of diet, who presented neurotic symptoms. It seems a pity to call those your enemies who should be your allies, and I should like to say that psychotherapists are not in the habit of thinking of those colleagues who study the physical reactions of the organism as hostile, nor hitherto have I thought that those physicians, who have asked for my help from the mental aspect, have thought of me as the enemy. Mr. Coke's own work on the physical aspect of asthma has always excited my admiration, and my personal acquaintance with some of his patients—whom, by the way, I had never treated—has convinced me of its soundness. But because he and others have relieved some illness or have shown that some symptoms are produced by physical means, we should not jump to the conclusion that those who believe that other illnesses are psychogenic and to be treated by psychotherapy are enemies. Even if we cannot have allies we might have neighbours. It is no new discovery that mental symptoms may have physical causes ; the toxic psychoses, general paralysis, and the mental symptoms of encephalitis lethargica may furnish examples, and have been known for some time. Certain conditions, on the other hand, such as the reflex paralysis of Babinski, which were at one time thought to be physical in origin, are now known to be mental. This discovery was made because of the joint work of neurologists and psychotherapists, and not as the result of warfare between them.

The distinction in meaning between the conceptions "psychogenesis" and "physicogenesis" is more difficult than Mr. Coke's expressions of opinion would imply. Psychogeny cannot be affirmed from the absence of physical reactions, neither of course can it be denied from their mere presence ; that the presenting symptoms are mainly nervous is no criterion. It is, however, the first statement that I wish to emphasise, for Mr. Coke seems to think that the diagnosis of psychogeny is made by those who cannot find any physical reason for symptoms. The conception does not depend in the least on negative findings. The diagnosis must always depend on findings which are at least as positive as those by which Mr. Coke obtains his brilliant results in certain cases of asthma. It would take too long to go into these diagnostic points here, but if Mr. Coke cares to receive it I shall be happy to send him a small contribution of my own on the subject.

Mr. Coke cannot understand why I should think he disbelieves his patients (I did not say *all* his patients), but if he will re-read his letters he will see that they do imply that neurotics are unworthy of credence ; surely his contention that the asthmatic when he was thought to be a neurotic was not believed implies that naturally no one would believe a neurotic. I am sorry that I am so dense or so ill-educated as not to understand the meaning of Mr. Coke's remarks about his thumbs, but I wish he would stop turning them downwards against the unhappy sufferers from neurosis.

I am, Sir, yours faithfully,

T. A. ROSS.

The Cassel Hospital for Functional Nervous Disorders, Penshurst, Kent, Feb. 18th, 1929.

To the Editor of THE LANCET.

SIR,—May I add another vertebra to the snake of correspondence which is wriggling its way through your columns ? The head of the beast was innocent enough ; it consisted of a letter signed by Eminent Persons saying that there is no single infallible cure for all cases of asthma. I myself would not care to put my name beneath such a statement—in THE LANCET because it is a platitude, in the lay press because readers might assume that such cures existed in other diseases.

It worried Mr. Coke too ; he wishes it to be known that there are cures for some and hope for all asthmatics. Unfortunately, in saying this, he says that in the past they have been classed as neurotics with small benefit to themselves ; so now, of course, he is catching it from the psychologists, though apparently he intended no attack on them and

though his words were true enough as used by ordinary men. If I may beg the question that hay-fever belongs to the asthma group, I should like to put on record that 19 years ago when I first started working at hay-fever, at least four out of every five patients had been told by their doctors that the disease was neurotic and that "if they did not think about it they would not have it"—they had therefore stopped going to doctors about it. We do not say this to them so often now—not because psychology has made advances, but because the grass pollen factor is too well known.

I believe firmly that all examples of the asthma syndrome—including Dr. Culpin's dermographia—are necessarily "psychogenic" in the sense that something psychological is essential to the mechanism of asthma, &c. But the psychologists have not proved very helpful. They demand the whole stage for their complexes which they consider the "main cause." Thus they fall into the same error as that which assails Mr. Coke when he declares that the "main cause" is the protein factor; for there are many many other "main causes" in the full make-up of the pathological mechanism of asthma.

Meantime the fact that a patient loses his asthma after the neat enucleation of a complex does not prove very much; they get well only too readily under the influence of any scientific bandobust.

I am, Sir, yours faithfully,

JOHN FREEMAN.

Devonshire-place, W., Feb. 19th, 1929.

To the Editor of THE LANCET.

SIR,—There is now little difference between the views of Mr. Coke and my own. The stigma originally affixed to the neurotic he extends to all imperfections of health, beauty, or strength, and though I might not support this thesis, yet I do not oppose it. His interest in cat phobia is welcome; whether any sensitiveness is demonstrable by skin reactions is just the kind of problem that calls for the coöperation of biochemists and psychologists. The phobia does not necessarily depend upon sight or smell, for I have seen it called up by a suggestion that the animal is present. Patients have said that the terror may precede conscious recognition of the presence of the animal, and this is perhaps related to the hyperæsthesia of some of the special senses that exists in such abnormal conditions as hypnosis and other states of dissociation. The patient feels the terror and is not aware of the sensory impressions that have called it up, but in the absence of some training in abnormal psychology this statement, though it must be accepted, is not easy to bring into accord with a priori ideas about mental processes. The behaviour of the cat phobia reminds us of authenticated cases in which hay-fever has been induced by the sight of an artificial flower. A well-known physiologist has described to me how the sight of a painting of a particular fruit brings on in him a mild attack of asthma, which he ascribes to a conditioned reflex.

One apparent difference does not exist. Mr. Coke "takes the battle into the enemy's country" and describes successful results of biochemical methods as if they contradicted some argument of mine. I have in this correspondence given full acknowledgment of the value of biochemical research, have favoured no particular therapy, and have not claimed ever to have treated an asthmatic.

I am, Sir, yours faithfully,

MILLAIS CULPIN.

Queen Anne-street, W., Feb. 17th, 1929.

URÆMIA SIMULATING ACUTE INTESTINAL OBSTRUCTION.

To the Editor of THE LANCET.

SIR,—Dr. Leslie Cole's interesting account in your issue of Jan. 19th (p. 128) of a case of uræmia simulating acute intestinal obstruction prompts us to summarise the notes of a case recently observed at Ancoats Hospital, Manchester.

A. B., aged 28, a goods porter, was admitted on July 3rd, 1928, in a comatose condition. The history obtained from the relatives was that he had started with colicky abdominal pain round the umbilicus on June 29th. The bowels had not acted since July 1st, and on the same day he commenced to vomit. Vomiting persisted, and on admission was fæculent. The abdomen was distended and visible peristalsis was observed. At this stage the blood-urea (urease method) was 240 mg. per 100 c.cm. The urine was dark and showed a few casts but no albumin. Later the cerebrospinal fluid urea-content (hypobromite method) was 350 mg. The comatose condition was so profound that death was considered imminent and operative interference useless. Improvement was shown, however, after intravenous saline and Mr. Hughes operated. Obstruction due to a band was found four feet above the ileocæcal valve, division of which resulted in the patient's return to consciousness on the following morning. An uninterrupted recovery followed. 9.7.28.—Blood-urea 40. 21.1.29.—Blood-urea 21. Urine showed no albumin or casts.

There is, in this case, no suggestion of mechanica interference with the urinary tract. The dramatic fall in blood-urea after operation practically negatives the possibility of a coincident nephritis, the presence of a few casts being the only evidence of renal damage, due, no doubt, to the general toxæmia. If the theory of deficient excretion can be put aside it becomes necessary to find some other explanation for the enormous rise in the blood-urea content. Our tentative suggestion is that this is to be found in an active hyper-production of urea by the liver, from the toxic intermediate products of protein digestion absorbed from the obstructed gut.

We are, Sir, yours faithfully,

M. LESLIE-SMITH, M.B., B.S. Lond.,
Pathological Registrar, Ancoats Hospital.

KENNETH HERITAGE, M.B., B.S., F.R.C.S.,
Feb. 18th, 1929. Resident Surgical Officer to the Hospital.

LOCAL ANÆSTHESIA IN UPPER ABDOMINAL SURGERY.

To the Editor of THE LANCET.

SIR,—Dr. W. Howard Jones's appreciative letter was of great interest to me from two points of view, as he has come to diametrically opposite conclusions to myself about the use of spinal anæsthesia.

He claims to have a large experience of injecting novocaine between the last dorsal and first lumbar spines, the region corresponding to the lumbar enlargement of the spinal cord. I cannot help thinking that he is fortunate not to have had any bad after-effects. A puncture of the spinal cord with a fine needle in itself is probably not a serious accident, but should one of the vessels be injured a hæmorrhage into the cord might easily take place and be followed by irreparable damage. Any surgeon who has exposed the cord by laminectomy will realise this possibility. When there is general anæsthesia as a safe alternative it is not worth the risk. Every puncture done for spinal anæsthesia should be made below the level of the spinal cord.

Dr. Howard Jones also maintains that for upper abdominal surgery spinal anæsthesia should be combined with general narcosis, and that intratracheal insufflation is the best method to adopt. I have the greatest dislike to a combination of general with either splanchnic or spinal anæsthesia for upper abdominal operating. I am not able to quote actual figures, but I have a very strong impression that pulmonary complications are, if anything, more frequent after operations performed under combined splanchnic and general anæsthesia than under general anæsthesia alone. If the tracheal insufflation is required it means that deep anæsthesia must be reached or the catheter will not be tolerated. Combined anæsthesia of this kind has all the disadvantages of general anæsthesia and none of the advantages of local anæsthesia.

As to the question of the spread of fluid in the spinal canal, it is against all the teaching of physical science to suppose that it is brought about by diffusion.

It is the simplest thing in the world to demonstrate that gravity does play a very important part in determining the position of an injected heavy fluid.

It is a great satisfaction to me to know that active work in spinal anæsthesia for higher abdominal operating is going on in several clinics in London.

I am, Sir, yours faithfully,

CHARLES A. PANNETT.

St. Mary's Hospital, W., Feb. 15th, 1929.

TRACHEAL INSUFFLATION.

To the Editor of THE LANCET.

SIR,—In his valuable article last week (p. 330), Dr. Howard Jones deserves commendation for drawing attention to a very important fact which is, I am sure, often overlooked by anæsthetists. What he terms "complete tracheal insufflation" is extremely difficult to obtain with most intratracheal apparatus, and the danger of the aspiration of fluids in mouth operations is a very real one.

For several years I have used a method of single intubation which does, I think, avoid all danger of the aspiration of fluids into the trachea. A single tube made of thin-walled but moderately hard rubber is passed (via the mouth or nose) into the trachea, and connected by suitable fittings to a bag made of rubber, which is of such a thickness that it is impossible to raise the pressure inside above 20 mm. Hg without blowing it up to at least four times its normal size.* The anæsthetic is supplied from a gas and oxygen apparatus. By keeping the bag very slightly distended I am able to maintain a constant, though never dangerous, positive pressure in the trachea, and so avoid all possibility of the aspiration of fluids. Moreover, this positive pressure overcomes any resistance to the passage of the respirations through the tube.

I am, Sir, yours faithfully,

STANLEY ROWBOTHAM.

Harley-street, W., Feb. 19th, 1929.

"THE BRITISH JOURNAL OF UROLOGY."

To the Editor of THE LANCET.

SIR,—We are writing to enlist your sympathy for our new venture, the *British Journal of Urology*, which will make its first appearance in March. It has long been a source of wonder to foreign observers that there should exist no British journal devoted to urology, which has become a universally recognised specialty, and is being taken up by an increasing number of young men in England to-day; whereas for a long time past journals of urology have appeared in America, France, Germany, Italy, and Spain. Since 1911 there has been an active British section taking part in the Congresses of the International Society of Urology. Again, and when the time was ripe, the Council of the Royal Society of Medicine thought fit to establish the subject of urology as a separate section, and not as a subsection of surgery, thereby showing that they held that urology was entitled to be separated off as a special subject for study.

We realise fully the generous help given hitherto by your journal in publishing a number of important articles on urology as practised in Great Britain; nevertheless, we feel that there is nowadays such a abundance of special work being done that can only find a voice if it can be given the additional outlet of a journal specially devoted to the subject. Such a journal is bound also to enhance the prestige of British urology. We feel sure, therefore, that our publication will in no way be hindering, but on the contrary will be supplementing, your efforts to forward the reputation of British medicine. A large editorial committee has been formed representing urologists in all the British-speaking countries of the world, and they intend, under our combined editorship, to bring out quarterly a British Journal of Urology (published by Messrs. Constable and Co., Ltd.), which will circulate not only in this country but in America and abroad.

The journal will publish original articles (freely illustrated), and full abstracts of the current urological literature. It will contain in each number a short practical article on common disorders of the urinary tract, calculated to help the general practitioner, notes on biochemistry, chemotherapy, and radiotherapy, and an up-to-date list of urological clinics, whereby foreign visitors to this country may find a ready guide to the clinics they wish to visit.

We are, Sir, yours faithfully,

FRANK KIDD,

H. P. WINSBURY WHITE,

Feb. 19th, 1929. Editors.

* The bag and fittings are supplied by Mayer and Phelps.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE LOCAL GOVERNMENT BILL.

ON Feb. 12th the House of Commons further considered the Local Government Bill on Report.

Provisions as to Alternative Powers of Giving Assistance.

Mr. CHAMBERLAIN (Minister of Health) moved an amendment to Clause 5 to provide that a council in preparing an administrative scheme should have regard to the desirability of securing that as soon as circumstances permit all assistance which could lawfully be provided otherwise than by way of poor relief should be so provided. He explained that the amendment carried out an undertaking he had given to put into this clause some indication of the Government's intentions, as the clause could not be made mandatory.

The amendment was agreed to.

Guardians' Committees and Subcommittees.

On Clause 7, para. 1, of which says: "In the case of a county the administrative scheme shall, unless the Minister for some special reason otherwise directs, provide,"

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) moved to omit the words "unless the Minister for some special reason otherwise directs." He said that as the clause was originally drawn it gave too wide a power to the Minister of Health and it might be argued that he could give a direction the effect of which would enable a council to vary any of the provisions of Subsection 1 of the clause. That was not the intention, and the amendment would make it clear that it was only in exceptional circumstances, and at the instance of the local authority, that the Minister could make an exception with regard to the appointment of guardians' committees.

The amendment was agreed to.

Sir KINGSLEY WOOD moved an amendment providing for the increase of the maximum number of members of the guardians' committees from 24 to 36. He said the Minister desired to utilise as much as possible the knowledge, personal influence, and touch of the members of the old boards of guardians, and the amendment was designed for that purpose.

The amendment was agreed to.

A Government amendment was also agreed to providing that a person should not be disqualified from being a member of a county or county borough council solely by reason of the fact that he or a member of his family had been maintained in an institution as a pauper lunatic.

Recovery of Expenses.

Mr. PETHICK-LAWRENCE moved to leave out Clause 15 which, he said, he regarded as the most dangerous and inimical to public health of any clause in the Bill. In the first place, it compelled local authorities to make a charge on all persons using their health institutions, with certain exceptions; and, in the second place, it fixed the amount that they must charge. That charge was to be deemed to be a sum representing the average daily cost per patient of the maintenance at the institution and the staff thereof, and the maintenance and the treatment of the patients therein. He had made some investigations as to what those sums amounted to in the case of the voluntary hospitals in London, and, omitting some of the charges which he thought would be excluded by these words, he reckoned that they would run from £2 5*s.* or £2 10*s.* a week per patient in the case of a maternity home to £4 5*s.* or £4 10*s.* in the case of a cancer hospital. Not only was the charge to be made on the patients themselves, but if the patient could not pay all the persons upon whom a patient was regarded as dependent could be called upon for payment.

In maternity cases the charge would not be for more than two or three weeks, but in certain illnesses, notably cancer, it might run to three months and the charge therefore would be about £50. The chief exceptions were those relating to infectious disease. He understood that no actual definition of infectious disease had been included in the definition clause, and that the Ministry of Health held that the term would include what was commonly known as infectious disease to doctors and also venereal disease and pulmonary tuberculosis, but that it would exclude certifiable tuberculosis. As had been pointed out on the Committee stage, this provision as it stood would mean that a labourer earning £2 a week who had contrived to save £40 or £50 in the course of his life might have all those savings taken to cover the charges, say, for his wife's treatment in a cancer hospital. The effect would be that numbers of working people, realising this state of affairs, would go to any lengths to avoid entering an institution. Therefore it was not merely a question of the hardship involved to these people; it was also a question of the grave detriment to public health which would arise if the clause was carried in its present form. The Minister had so far realised the force of the objections raised that he had given notice of an amendment which would enable local authorities not to charge the full bill not merely when they were satisfied that the patient or his relatives could not pay it, but also when they thought it unreasonable that they should pay it. That was a great advance on the clause as it stood, but it was still insufficient. He still thought that to include in the cost of maintenance a sum representing the average daily cost per patient of the maintenance of the institution and staff thereof and the maintenance and treatment of the patients therein was too wide a definition. It covered in the case of a cancer hospital very expensive treatment and apparatus. In the second place, he very strongly objected to the wide area of relatives brought into the purview of this proposal. He would lay special stress upon the case of the unmarried mother. In the interests of public health and the future generation they had learned that it was desirable that any illegitimate child should come into the world so far as physical means were concerned with the very best chance for its own life and for the good of the community. It had been found by all the institutions which catered for maternity cases that it was most undesirable to insist upon the relatives knowing the facts with regard to an illegitimate birth. The provisions of this clause in this respect, therefore, would be highly undesirable from the point of view of public health. Illegitimate children would be born under most unsatisfactory conditions. In many cases attempts would be made to get rid of the child. If the Government could not agree to delete the clause he hoped that the House would not be contented with the proposed amendment of the Minister of Health but that something further would be done to meet the objections he had raised.

Sir KINGSLEY WOOD said that the reason for the insertion of this clause was the alteration which was being made by the transference from the guardians of their institutions to the larger local authorities of the country; and unless there was a clause of this kind in cases of poor-law administration the local authority would be under an obligation to charge a pauper for treatment, while in cases of institutions where people did not come under the operation of the poor-law the local authority would have no such duty cast upon them. How could one reasonably say that such a clause was detrimental to the public health? It was a clause in keeping with the English character and qualities and one which the people themselves would desire. Mr. Pethick-Lawrence had said that the net was spread too wide, and that they were trying to make too many people responsible for the unhappy person who had received treatment. That was a criticism not of the clause but of the existing law. The Poor-Law Act, 1927, Section 41, exactly defined the liability to relieve and maintain relatives. Was that an excessive duty, or one of which the average person could complain, if he were just and wanted to do his duty to himself and his family? There was no ground for the fears of the hon. Member in regard to the unmarried mother. There was not a maternity home in the country, municipal or voluntary, which did not make a charge for their patients. Anyone who considered the clause in a reasonable spirit, apart from political partisanship, knew that it really embodied what was the practice of the voluntary hospitals.

After further debate,

Dr. VERNON DAVIES said that as a medical man with some experience he hoped he would live long enough to see the treatment of disease according to need and not according to the financial capacity of the patient, and to see the break up of the poor-law. But they had been assured by the Minister of Health that at present the time for that was not ripe; that it would be impossible for this Bill to function and at the same time to break up the poor-law. So they had the position that under the poor-law the destitute poor or their relatives could be charged by the local authority a certain amount for their treatment and maintenance and that, on the other hand, the people who were not poor who were treated under the Public Health Act could escape free. That was a very alarming position which undoubtedly penalised the pauper. They would all have liked to have got rid of the pauper charge if they could, but not being able to do that—and he accepted the Minister's words whole-heartedly on that point—and as it was not possible even to put all sickness for the time being on the same level, the Minister was making a charge for everybody according to their means. There was to be no increase of the present charge according to the poor-law; they were to go on as they had been going on for many years. He had for many years experience in an industrial practice and he had very often the experience of patients who had to go to voluntary hospitals and also to the poor-law hospitals. Never in the whole of his experience had he come across a case where any complaint had been made by patients or relatives of undue charges for hospital attendance, either in the poor-law hospitals or the voluntary hospitals. The circumstances of the patient were taken into account, the circumstances of the relatives were taken into account, and his experience had been that the people when they came out were very grateful for what had been done to them. That was not going to be altered by this Bill. The Labour Party were, perhaps, unduly apprehensive of the dangers of this clause. They seemed to think that people would be afraid to go to the hospitals on account of the charge. When people were ill money did not count. Treatment came first and they went to the hospitals and were only too glad to get there. He could not understand why members of the Labour Party should have the idea that the Government, the hospital authorities, and the guardians of the poor were simply out to rob the poor of all they could. The suggestion was that the charge they were going to make, legally or illegally, was so high that the people would be terrified to go into hospitals on account of that charge.

Mr. PETHICK-LAWRENCE: The hon. gentleman is not entitled to make any allegation of that sort. The great object of our amendment is to leave the local authorities and the public health authorities in the locality with the option. Our objection is that this clause takes away the poor-law option and imposes upon them a definite course of action which we think is undesirable.

Dr. DAVIES said that he was referring to the statements which had been made by members of the Labour Party. With a fairly long experience he had not known these things happen up to the present under the poor-law and therefore he failed to see why it should be imagined that they would happen in future. He had more trust in the people of this country and in the guardians than to believe that they would allow people to be badly treated. He was sure that this clause would be of great benefit to the people.

The amendment was negatived by 221 votes to 114.

On Feb. 13th the House further considered the Local Government Bill on Report.

Town-planning.

On Clause 38 (Power of County Councils to act jointly with other local authorities in preparation or adoption of a town-planning scheme),

Mr. CHAMBERLAIN moved a new subsection extending the clause to the County of London. He said that the London County Council was already a town-planning authority, but it was desirable that it should have the power to act jointly with other councils in regard to town-planning.

The amendment was agreed to.

Mr. HARRIS moved an amendment to provide that local authorities should be required to prepare town-planning schemes by Dec. 31st, 1930, instead of Jan. 1st, 1939, as provided in the Bill.

Sir KINGSLEY WOOD said that they were all anxious to see town-planning put into force as rapidly as possible, but they had to consider how soon local authorities should be forced to bring forward town-planning schemes. Above everything else they wanted good town-planning schemes rather than quick ones.

The amendment was negatived by 218 votes to 129.

On Feb. 15th the House further considered the Local Government Bill on Report.

Superannuation of Transferred Poor-law Officers.

On Clause 114 Sir KINGSLEY WOOD said that at a conference recently held between the Minister of Health and the representatives of the officers the matter was discussed. It was the desire of the Government to treat these officers justly and fairly and as a result of the conference he now proposed to move an amendment. This allowed the existing officers to elect to remain under the Poor-law Officers' (Superannuation) Act 1896, even although their new employers might have a superannuation scheme under the Local Government and Other Officers' (Superannuation) Act, 1922, or any local Act. By agreement this option was limited with the result that if Parliament should

ake provision for the extension of the Act of 1922 to all unties and county boroughs which had no local Acts, then e officers would all come under the Act of 1922.
The amendment was agreed to.

Power to Remove Difficulties.

Sir H. SLESSER moved to leave out Clause 120. He said at on the Committee stage there was considerable objection the power which the Minister of Health sought to take—mely, that when what the Minister thought was a fficulty over the Bill arose by Order he might remove make any appointment, or do any other thing which peared to him necessary or expedient and that such an der might embody the provisions of the Bill. When rliament had set a limit to a particular Act it was in inciple most dangerous and inexpedient to give to a inister or a Department power to vary that Act even with e protection that they were compelled to lay the Order bsequently on the table of the House. The question at ue was whether it was in the interests of the State that inisters should be given the power to alter an Act of rliament without any definition of the limitations of those erations.

Mr. CHAMBERLAIN said that these powers were not for e exaltation of the bureaucracy in order that they might terfere with the intentions of Parliament. They were wers asked for in the general interest of the public to get er difficulties which had not, and very likely could not, ve been foreseen, but which would hold up the working the Act in particular places and on particular occasions. e clause had only a limited period of operation and could t go on after Dec. 31st, 1930. There was nothing at all constitutional, arbitrary, or dictatorial in the mind of the vernment, or of those who would have to apply the words the clause hereafter.

After further debate Sir H. SLESSER's amendment was gatived by 207 votes to 119.

Sir KINGSLEY WOOD then moved to leave out the words the clause "may by Order remove the difficulty or make y appointment or do any other thing which appears to m necessary or expedient for bringing the said provisions to operation," and to insert the words "make such der for removing the difficulty as he may judge to be cessary for that purpose."

The amendment was agreed to.

The Report stage of the Bill was concluded.

The Third Reading of the Bill.

On Monday, Feb. 18th, Mr. CHAMBERLAIN, in moving the ird reading of the Local Government Bill, said that he uld not remember any measure comparable with this length, in importance, in complexity, embodying so any diverse features, and vitally affecting so many portant interests, which had come through its various ages in that House with so little alteration. Nobody who d listened to the debates would dispute for a moment at the discussions on maternity and child welfare services, e future of the poor-law, the administration of the ansferred functions, the working of the formula, and other atters, had been most illuminating, and if the amendments hich had resulted had not gone down to the roots of the ll it must be admitted that they had been extremely luable both as defining more closely what were the tentions of the Government and as illustrating more ecisely what was likely to be the effect of the Government's oposals. On the second reading of the Bill he had umerated five outstanding defects of local government hich this Bill was designed to remedy. No single voice d challenged the existence of those defects and no single rty had challenged the fitness of the remedy which the vernment were seeking to apply to the first three of em—the administration of the poor-law, the responsibility for the maintenance of highways, and the power that was ven to county councils to review the boundaries and the ture and the character of the authorities which governed county districts. The first five parts of the Bill, comning more than half the total number of clauses, appeared day almost as they were when the Bill was introduced. e formula had one advantage which no amount of oretical casuistry, or cheap mockery about sums in mentary algebra, could take away from it—if worked. put the money where they wanted it to go. He was tain that this formula was going to provide local authorities h ample funds for their services, including health services, l particularly those services which were concerned with thers and children, which must be extended. He coupled h those services the voluntary associations to whom power s now given to make representations to the Minister if y found that local authorities were backward in giving services for which their resources had been extended. wer had been given to the Minister under Clause 94 to ng up the standard of backward or recalcitrant authorities. this scheme they had a measure which was not only not ng to stifle or cripple the local services, but which was going to prove a jumping-off ground for a fresh leap forward in the standard of health and welfare of the community throughout the country.

A Labour Amendment.

Mr. ARTHUR GREENWOOD, on behalf of the Labour Party, moved the following amendment:—

That this House declines to assent to the Third Reading of a Bill the most important provisions of which have not received adequate parliamentary discussion and which, purporting to stimulate trade, secure reforms in local government, and regulate the financial relations between the State and local services, ignores the fundamental remedies for trade depression, and is unacceptable to local authorities on account of the confusion it will create in the realm of local government, its failure to accept national responsibility for burdens wrongfully imposed locally, its provisions for relieving some ratepayers at the expense of others, and the effect it will have in degrading the standard of the social services and crippling their development through the impoverishment of local resources and a system of State grants based upon a false national economy.

He said that as a measure of local government reform the Bill was pettifogging and partial. It did not cover the ground and it would lead to other problems of local government which would have to be solved in the future. It would leave far more disaster behind than blessings in its train.

Mr. PETHICK-LAWRENCE, in seconding the amendment, said that in one street there might be a brewery, a hospital, and a shop. The Bill would give relief to the brewery, but none to the hospital or the shop.

After further debate,

A Medical View.

Lieut.-Colonel FREMANTLE said he desired to sum up the use and value of this measure to public health and local government services with which he had always been associated. He expressed surprise at many of the criticisms made from the other side of the House. With some of those criticisms he had the greatest sympathy. He knew the difficulties of a reform of this sort, but some of the criticisms were surprising when one remembered the way in which from all sides the progressive forces were working in this very direction 20 years ago. He was, at that time, not only a medical officer of health, but a prospective candidate for Parliament. He had the advantage of belonging to a committee of the Unionist Party in that House, which brought in one or two co-opted Members from outside to help and advise them. That committee included one future Lord Chancellor, one future Parliamentary Secretary of the Ministry of Health, and the present Prime Minister. The secretary of the committee was a very remarkable man, who unfortunately never attained to membership of the House of Commons, but who did wonderful work in his own line. He was a man of great chivalry and originality, whose death was announced in that day's papers—Mr. Maurice Woods, the son of the late Master of the Temple. After very hard work the committee produced a report. As the war had broken out he (Colonel Fremantle) was abroad when the report was presented, and he only saw it when he returned from the war. The report dealt with the poor-law situation and tried to get a practical *via media* between the Majority and the Minority Reports of the Poor-Law Commission. It dealt especially with the proposals as they affected public health. He was surprised to find, on looking at that report the other day, how the present Bill brought, to a very large extent, into force exactly the same measures which were then advocated with very considerable temerity and difficulty because of the novelty of the subject. From the point of view of public health he took it that when they were going to have a measure of definite de-rating relief for productive industry it was really intended to help productive industry. Those who believed in that recognised that that went at once to the root of public health, because nothing so much affected the health of the nation as its material prosperity, apart from its moral and spiritual prosperity, which they were not discussing in that Bill. Agriculture was of value from the health point of view, because it was the basis of the country life, and it would be of very material help that £6,000,000 was definitely given to agriculture. After all, the poor-law, which was the chief administrative subject changed in the Bill, was the first main provision for public health made by Parliament in this country. With its institutional and outdoor relief it gradually developed a medical system of attendances free to every man, woman, and child, and it was unfortunate that as that system developed and the time became ripe for a further advance in local government, that parties on both sides of the House rejected the proper evolutionary way of developing the health services. Instead of continuing their health services on the poor-law system, they set up a new system of urban and rural district councils. In the past 40 years public health had been faced with the difficulty of a multitude and tangle of different authorities, which had inevitably meant much inefficiency, weakness of resource, and dissipation of

attention and energy. Medical officers of health who were concerned in trying to carry out health measures saw the enormous resources of the poor-law institutions, from which they were cut off and with which they could have nothing to do; the outdoor domiciliary attendance, with which they could have nothing to do; the system of vaccination, and medical attention of one kind or another. The first thing they would have wished for would be the consolidation of those measures. Members of the Opposition had suggested that the Bill was no improvement, but would lead to confusion. That was an absurd suggestion. It was certainly not a final solution of the problem, but it was going in the right direction, and in the gentle manner in which English reform always found its way. It first put the poor-law into the hands of the county councils, and how Members opposite, who really understood the subject, could suggest that that was wrong he did not know. At the same time they were coördinating in many ways the work of the county councils with that of the local sanitary authorities. He attached a very great deal of value to the powers given in the Bill for the reconsideration, overhauling, and systematisation of the schemes for dealing with infectious diseases, the water-supply, and sewage disposal throughout the country. It was inevitable that for those interested in these things there were one or two points on which they were still not entirely satisfied. In a measure of this complexity there must be some minor points which remained to be settled, and he hoped that further amendments would be made in the House of Lords dealing with points which had been left undiscussed owing to the operation of the guillotine resolution. The progress outlined in this Bill was in the direction of systematisation, and he thought that the objections which had been urged to that systematisation were rather absurd. He disputed the view of the legal profession that everything must be laid down by Act of Parliament. It was necessary that the Minister should have some power to make rules and interpret the measure. He hoped, however, that some scheme might be devised by which Orders laid on the table of the House could be brought to the notice of Members, in such a way that they would be bound to take notice of them.

The Value of Coöperation.

Mr. GATES said that when he criticised the Bill before he did so on the ground that he was afraid that the maternity and child welfare services would suffer if they were put upon the block grant system. He confessed that a great many of the voluntary associations were still not quite easy in their minds, but they were a great deal easier since certain amendments had been inserted in the Bill by the Government. He was not afraid from the point of view of health of what was called the reign of bureaucracy in Whitehall. The voluntary associations which had done so much work in connexion with public health services would have much preferred that the maternity and child welfare services should still have been left on the percentage grant system for the original term of seven years, if that had been possible. He was, however, glad to hear from the Minister that he shared with him, and most of those who were interested in maternity and child welfare, their admiration for the coöperation of the voluntary associations with the officials. The coupling of the enthusiasm of those associations with the work of the officials had been of enormous value to public health. He knew that the Minister attached more importance to Clause 94, which was a punitive clause, than he, or the voluntary associations, did. It was a clause which he was afraid could only be used in very rare cases to speed up a laggard authority to a mere minimum of health services, and then only when the Minister was satisfied that the Council was failing to maintain a reasonable standard of efficiency and progress having regard to the standard maintained in similar boroughs. The voluntary associations could not help being afraid that many councils would prefer to use the block grants for the purpose of reducing their rates rather than for promoting these services. He thought this was an unfounded fear, and that the Government's amendments would reduce the grounds for such a fear to a minimum.

Reply to the Debate.

Sir KINGSLEY WOOD, replying to the debate, said that one of the most unfounded criticisms of the Bill was that which found a place in the Labour Party amendment—namely, that the proposals of the Bill would degrade the standard of social service in the country. The discussion on block versus percentage grants had amply demonstrated that there was hardly anyone who was prepared to stand up wholly for the present percentage grant system. A most welcome fact had been the considerable change of opinion among people who were particularly interested in the maternity and child welfare service proposals of the Bill. It had been more and more appreciated that the present system benefited the rich areas and handicapped the poor areas, and that there was no effective power vested in the Minister of Health to bring about a better state of things in the case of an authority that was not properly discharging its health duties and functions. The debates on this Bill had clearly demonstrated that the new system would at any rate remedy many of those grave defects.

The Labour amendment was rejected by 292 votes to 113, and the Bill was then read the third time.

HOUSE OF LORDS.

TUESDAY, FEB. 19TH.

AGE OF MARRIAGE BILL.

Lord BUCKMASTER moved the second reading of the Age of Marriage Bill, which seeks to make void marriages between persons either of whom is under the age of 16. He said that the measure was intended to remove a great disgrace on our laws, and to put our position in regard to marriage on the same basis as some of the more advanced countries in this respect. By the law of this country it was possible for marriage to be validly solemnised, with the necessary consent, between a girl of 12 and a boy of 14. The reason that was given for this age in the ancient text-books was as follows: "It is not because the parties are supposed to have sufficient discretion to appreciate the consequences of so critical and responsible an engagement, but because in general they at that time arrive at physical maturity and the worst social evils will ensue from holding them incapable of marriage." Everybody to-day recognised that to enable children of 12 and 14 to undertake what everyone regarded as the most solemn responsibility of life was a thing almost entirely contrary to our good sense. It was at this moment a criminal offence for a man to have relations with a girl under the age of 16. She was incapable of consenting. Was it not a remarkable thing that what a girl was not capable of consenting to once she could consent to in perpetuity, and that by law she was enabled to protect the man from his criminal action by the mere process of going through the ceremony of marriage? It might be that the number of such marriages was small, but that had nothing whatever to do with it.

The Marquess of SALISBURY (Lord Privy Seal) said that the Government were willing to accept the Bill.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 13TH.

Replacement of Surgical Boots.

Mr. THURTLE asked the Minister of Pensions if there was any fixed period that surgical boots provided by the Ministry had to last before they could be replaced by new ones.—Lieut.-Colonel STANLEY (Parliamentary Secretary to the Ministry of Pensions) replied: Surgical boots are issued in duplicate and while each pair is expected to last two years they may be replaced at an earlier date if worn out by fair wear and tear.

The Sale of Aspirin.

Sir ROBERT THOMAS asked the Minister of Health whether he was aware that there was a movement to instal automatic machines for the sale of aspirin; and whether his advisers were of opinion that such uncontrolled sale of this drug was in the public interest.—Sir KINGSLEY WOOD replied: I understand that this question has been referred to the Inter-Departmental Committee on the Poisons and Pharmacy Acts, and my right hon. friend must await their report before expressing any opinion upon it.

Sir W. SUGDEN asked if the right hon. gentleman was aware that aspirin was being widely advertised and sold as "Aspro" without a label in small pennyworths in little shops throughout the country.

No further answer was given.

Assessment of Voluntary Hospitals.

Sir NICHOLAS GRATTAN-DOYLE asked the Minister of Health whether his attention had been called to the increased assessments under the Rating and Valuation Act, 1925, on provincial voluntary hospitals; and whether, in view of the public service rendered by these institutions and of their financial position, he would consider either derating them or giving them preferential terms of assessment.—Sir KINGSLEY WOOD replied: As my right hon. friend has previously explained, the exemption of hospitals from rating could not be effected without legislation, and he does not consider that such a proposal can be considered apart from the similar claims made on behalf of other charitable and public institutions. The same considerations apply to preferential terms of assessment. The Central Valuation Committee has made certain recommendations with respect to the assessment of hospitals and charitable institutions and where these have been adopted there should be no undue hardship.

Sir N. GRATTAN-DOYLE: Will the right hon. gentleman consider the desirability of introducing legislation to cover all those points which he has mentioned?

Sir KINGSLEY WOOD: I am sure we all desire to do what we can for the voluntary hospitals, but the hon. Member will no doubt realise that if one began to give preferential treatment in this way to voluntary hospitals one would immediately be confronted with claims on behalf of institutions for the blind and other institutions. This raises a very big and important question which it is hardly possible to deal with by way of question and answer.

Opium Traffic at Hong-Kong.

Mr. PONSONBY asked the Secretary of State for the Colonies whether, in view of the statement made to the League of Nations Opium Commission at its recent session by the British representative regarding the excessive consumption of opium at Hong-Kong, he could state what measures were being taken by the Government of Hong-Kong to restrict the consumption, and what reasons it gave for its failure.—Mr. AMERY replied: As was explained by the British representative in his statement to the League of Nations Advisory Committee the excessive consumption of opium in Hong-Kong is due to the large quantities of smuggled opium which pour into the Colony from China. The Colonial Government has established a legal Government monopoly of the sale of opium with the intention of restricting consumption by charging high prices for Government opium. That monopoly, however, is not effective because, in spite of an energetic preventive service which seizes large quantities of illicit opium and the punishment of large numbers of offenders by fines and imprisonment, it has been impossible to prevent the smuggling on account of the abundance of cheap opium in China and the facilities for illicit traffic provided by the close proximity to and regular intercourse with Chinese territory. Primarily in the hope that it will suggest a means of solving the extremely difficult problem in Hong-Kong, His Majesty's Government suggested last year that the League of Nations should send a Commission of Inquiry to investigate the opium problem in the Far East and the League have agreed to do so.

THURSDAY, FEB. 15TH.

Review of Final Pension Awards.

Sir WALTER DE FRECE asked the Minister of Pensions in how many Great War pension cases final awards were reviewed during 1928, and with what results.—Major TRYON replied: During the period referred to about 1300 cases (including cases of re-amputation and second disabilities) have been reviewed and have received a further grant under special sanction.

Health of the Mercantile Marine.

Dr. VERNON DAVIES asked the President of the Board of Trade, if the joint advisory committee set up by the Board of Trade and the Ministry of Health had been given power to recommend fresh legislation under circumstances where this might appear to them to be necessary.—Sir P. CUNLIFFE-LISTER replied: The Joint Advisory Committee of the Board of Trade and the Ministry of Health have power to advise on any question affecting the health of the Mercantile Marine that either department may refer to them. There is nothing to prevent the committee from making proposals involving fresh legislation on any such question, if such a course appears to them to be desirable.

First Aid in Road Accidents.

Mr. HAYES asked the Home Secretary on what agencies the police relied in dealing with road accidents in the Metropolitan police area beyond the London County Council district and outside the area of the activities of the Red Cross ambulance services; and whether the police were experiencing any difficulty in the expeditious removal of injured persons to hospitals.—Sir WILLIAM JOYNSON-HICKS replied: The police make use of the ambulances of over 50 different agencies, including the St. John Ambulance Association, 42 urban district councils, and 13 borough councils, and it is only in very rare cases that any difficulty occurs in arranging for the expeditious removal of injured persons to hospital.

Clearance of Insanitary Areas.

Sir ROBERT GOWER asked the Minister of Health what schemes for the clearance of insanitary areas had been sanctioned by him during the 12 months preceding the 1st Feb., 1929, and the dates upon which such schemes, respectively received his sanction.—Mr. CHAMBERLAIN replied: The following statement gives the local authority and the date of confirmation in 1928:—

Chelsea M.B.C. (World's End Passage area): March 15th. Leeds T.C. (West-street area): April 18th. Sheffield T.C. (Lambert-street, Furnace Hill and Scotland-street area): May 7th. Knaresborough U.D.C. (Hope-street): July 5th. Wednesbury T.C. (Hall End): August 1st. Brampton R.D.C.: Aug. 13th. Preston T.C. (Poplar-street, &c., area): Sept. 14th. Rochdale T.C. (Richard-street area): Sept. 22nd. Exeter T.C. (No. 4 area, Section A): October 19th, Liverpool T.C. (Queen Anne-street): Nov. 23rd.

Duties on Radium Compounds.

Mr. WEDGWOOD BENN asked the Secretary to the Treasury whether he could state, for any convenient period, how much money was collected in duties on radium compounds prior to the temporary suspension of the tariff.—Mr. A. M. SAMUEL replied: The amount of duty recorded as collected in respect of radium compounds imported during the 12 months prior to May 15th, 1928 (i.e., the date on which the temporary suspension of the duty took effect) was £32.

Open-air School Classes.

Sir ROBERT THOMAS asked the President of the Board of Education how many open-air classes have been regularly held in London schools during the year 1928; how many children attended them; how did the attendance percentage compare with that of indoor classes, and what were the chief results observed as regards health.—Lord EUSTACE PERCY replied: 167 classes were conducted during the period. No separate records of attendance are available, but it appears to have been at least up to the average. The children are reported to have gained in health and mental alertness.

The Training of Midwives.

Mr. HANNON asked the Minister of Health whether he was aware that the Central Midwives Board had directed that pupil midwives at the two hospitals of the Birmingham guardians should cease to take their theoretical instruction within those hospitals; that those hospitals had highly qualified medical officers with ample experience in the training of midwives and were equipped with every modern facility; that the guardians of the Birmingham Union had expressed opposition to the proposed change which involved needless expenditure of public money and unnecessary expense to those receiving instruction; and if the Minister would recommend to the Central Midwives Board the propriety of withdrawing their direction pending the report of the departmental committee which had been appointed to consider the whole system of the training of midwives.—Mr. CHAMBERLAIN replied: I am aware generally of the position as stated in the first three parts of the question. This is, however, a matter in which I have no authority to interfere with the discretion of the Central Midwives Board, and I have accordingly not taken the action suggested in the last part of the question.

Mr. HANNON: Can my right hon. friend think out any means whereby he can prevent such autocratic action being taken by this Board?

Mr. CHAMBERLAIN: A departmental committee is considering this matter, and a question of this kind will, I think, come within the terms of reference.

London Lock Hospital.

Mr. PETHICK-LAWRENCE asked the Minister of Health whether he has now received the report of the committee appointed to inquire into the London Lock Hospital, and whether it was his intention to have it published.—Mr. CHAMBERLAIN replied: I have received the report and am in communication with the Governing Body of the hospital with regard to it. In the meantime I propose to reserve my decision on the question of publication.

MONDAY, FEB. 18TH.

Silicosis in the Pottery Industry.

Mr. HOLLINS asked the Home Secretary whether any date had been fixed for the issue of the draft regulations for amending the present regulations in the pottery industry, as recommended by the departmental committee appointed to consider a scheme of compensation for silicosis in the pottery industry, and what were the reasons for the delay in issuing the draft regulations.—Sir W. JOYNSON-HICKS replied: The issue of these regulations has been postponed pending the report of the committee which I appointed in December last to inquire into the medical arrangements for diagnosis of silicosis. It is essential that before attempting to deal with this question I should have the report of the medical investigation.

The Cocaine Traffic.

Mr. ROBERT MORRISON asked the Home Secretary the number of convictions during the past 12 months for illegal possession of cocaine and similar drugs, and whether this traffic had now decreased.—Sir W. JOYNSON-HICKS replied: The statistics in question are not yet available. While it is not possible to speak positively in a matter of this kind, the experience gained in the administration of the Dangerous Drugs Acts indicates that the illicit traffic in these drugs has very much diminished in this country since the institution of Control.

Disease in Imported Sheep Carcasses.

Mr. WILLIAM THORNE asked the Minister of Health approximately how many sheep had been examined and

the proportion condemned for caseous lymphadenitis since Sept. 1st, 1928, with the exception of imported mutton from New Zealand, by the municipalities of the city of London, Liverpool, Bristol, the county borough of Southampton, and the metropolitan boroughs of Southwark and Finsbury, respectively.—Sir KINGSLEY WOOD replied: The following is the information asked for: The numbers of sheep carcasses examined by the local authorities mentioned and the numbers condemned by them for caseous lymphadenitis since Sept. 1st, 1928, with the exception of imported mutton from New Zealand were as follows:—

	Examined.	Condemned.
City of London	125,140	12,099
Liverpool	54,668	3,336
Bristol	100	2
Southampton	2,131	70
Southwark	75,274	3,491
Finsbury	27,000(approx.)	2,003

These figures are made up to various dates from Jan. 31st onwards.

Town-planning in London.

Mr. HARRIS asked the Minister of Health when he received a request from the London County Council that the provisions of Part III. of the Local Government Bill dealing with town planning should not apply to London.—Sir KINGSLEY WOOD replied: Clauses 40–42 cannot in any case apply to London. As regards Clauses 38 and 39 my right hon. friend caused inquiry to be made after the proceedings in committee and ascertained from the clerk to the County Council that, while the application of Clause 38 to London raised no difficulty the application of Clause 39 was not likely to be acceptable to the County Council. The Bill was amended accordingly on report. Owing to the urgency of the matter there was not time to bring it before the Council.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on Feb. 16th the following degrees were conferred:—

M.B.—E. G. Recordon.

B.Chir.—I. C. C. Tchaperoff.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At an ordinary meeting of the Council of the College on Feb. 14th with Sir Berkeley Moynihan, the President, in the chair, Mr. R. P. Rowlands was appointed Bradshaw lecturer for the ensuing year and Mr. E. W. Hey Groves Hunterian Orator for the year 1930.

A letter was read from Sir James Berry resigning his seat on the Council, such resignation to take effect in June next. Sir James Berry's resignation was accepted with regret.

It was reported that an election of four Fellows to the Council will take place on Thursday, July 4th, to fill the vacancies occasioned by the retirement in rotation of Sir Holburt Waring, Mr. C. H. Fagge, and Mr. W. Sampson Handley, and by the resignation of Sir James Berry. Notice of the election will be given to the Fellows by advertisement and by circular on March 9th; March 18th will be the last day for the nomination of candidates and a voting paper will be sent on April 2nd to every Fellow of the College whose address is registered at the College.

It was further reported from information recently received from Canada that it appeared probable there would be a sufficient number of candidates to justify a primary examination for the Fellowship being held at Toronto this year, that the dates of examination had provisionally been fixed for August 6th and 7th for the written and August 9th and 10th for the viva voce examination, and that Profs. William Wright, W. E. le Gros Clark, C. Lovatt Evans, and John Mellanby had accepted the nomination to conduct the examination.

The diploma of Fellow was conferred upon Mr. Russell Claude Brock, Guy's Hospital, who has now complied with the by-laws of the College.

Diplomas in Public Health were conferred jointly with the Royal College of Physicians upon the candidates whose names were given in our issue of Feb. 9th (p. 317).

Diplomas of Member were conferred upon 143 candidates (including 15 women) who have passed the requisite examinations and have complied with the by-laws of the College. The names of these candidates are the same as those printed in our issue of Feb. 9th, in the list of Licentiates of the Royal College of Physicians, with the exception that H. Bernstein, M. K. Gyi, J. F. V. Lart, A. S. Rajasingham, B. W. Rycroft, and Florence Whitrow have previously received the Diploma of Member.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—A quarterly meeting of the College was held on Feb. 5th, with Dr. R. A. Fleming, the President, in the chair.

Dr. James Davidson Stuart Cameron and Dr. Archibald Nathaniel Shirley Carmichael were introduced and took their seats as Fellows of the College. Dr. Ella Ferrier Pringle and Dr. John Miller Woodburn Morison were elected to the Fellowship.

Dr. William Sidney Thayer, Emeritus Professor of Medicine of the Johns Hopkins Medical School, Baltimore, U.S.A., was appointed Gibson Lecturer for the triennial period, 1929–31.

HUNTERIAN SOCIETY.—The members of the Hunterian Society and their guests assembled at the Mayfair Hotel, Berkeley-street, W., on Feb. 14th, Dr. A. Westerman, the President, in the chair, when the 201st anniversary of the birth of John Hunter was celebrated. Covers were laid for 300 persons, and among those present were the Lord Mayor of London, the Dean of St. Paul's, Sir Mathew Fell (Director-General of the Army Medical Service), Mr. J. B. Aspinall (the City Remembrancer), Dr. W. M. Willoughby (M.O.H. for the City of London), Colonel Turnbull (Chief Commissioner of City Police), Sir George Buchanan, the Presidents of the Medical Society of London, the Harveian Society, the West London Medico-Chirurgical Society, and the Chelsea Clinical Society, Dr. Howard Humphris, Sir Bruce Bruce-Porter, and Dr. Leonard Williams. Following the loyal toasts, which were drunk with muscial honours, and the toast, "The Memory of John Hunter," which was honoured in silence, the Very Rev. Dean Inge, in proposing "The Hunterian Society," eulogised the medical profession, though he had not troubled doctors much, albeit he was in his seventieth year. Regarding the professions of medicine and the church as physicians of the body and of the soul, respectively, he urged that they should cultivate friendly relations and learn from each other. Psychology made a connecting link between religion and medicine, and if the one profession could renounce its proclivity for what he might call the magical element and the other its frequent disposition towards materialism, coöperation might follow with great advantage. He closed with an eloquent testimony to the practical effects of the advance of medicine.

Dr. Westerman, in reply, after recalling Hunter's position as the great pioneer of modern surgery, gave a sketch of the Hunterian Society which, he said, was founded in February, 1819, by a number of City doctors, for the cultivation and promotion of the science and practice of medicine, and the name of Hunter was adopted as an earnest of the spirit in which the affairs of the Society should be conducted. Without a breach the meetings of the Society had been held in the City of London, and though it had had its ups and downs it was very much alive at the present time; thus in 1922 there were 152 members, while at the present moment there were 350. The Society was open to all registered medical practitioners, including women, and these took an increasing interest, if not as yet an active part in the business. Dr. Westerman then recalled to the audience the fact that there had passed away during the week Miss Helen Hunter-Baillie, the senior representative of John Hunter's family, and concluded with a warm tribute to the Lord Mayor of London and his predecessors for their hospitality, to the hon. secretaries for their work, and especially to Mr. and Mrs. Mortimer Woolfe for much hospitality.

Mr. A. E. Mortimer Woolfe, in proposing the toast of "The Lord Mayor and the Corporation of the City of London," reminded his hearers that in the cricket match between Oxford and Cambridge 37 years or so ago the present Lord Mayor of London went in first for Cambridge, while the Rev. Canon T. R. Hine-Haycock, who had said grace that evening, went in first for Oxford. The Society had a life-long tradition of relations with the City of London and its Corporation, and it owed much to Sir Kynaston Studd, especially in the matter of the reception which had been given to Prof. Zaaijer, of Leyden, who delivered a Hunterian lecture at the Mansion House last month. The Lord Mayor, in reply, said that it was interesting to know that while the Society's meetings had been held in the City, many of them in the last seven years had been held at the Mansion House. It gave him pleasure to remember that a memorable one had been held in his year of office. Some of the activities of the City of London of to-day would have appealed, he was sure, strongly to John Hunter, for not only did the Corporation look after the health of the City, but took steps, through its medical organisation, to prevent malaria and other tropical diseases from entering the country. In this connexion, he added, it gave him particular pleasure to mention the good work done by Dr. Willoughby, who was now their medical officer of health. Sir Kynaston Studd having referred to the fact that only one Lord Mayor of London had been a medical man—namely, Sir Thomas Crosby in 1911—who was also, in his time, president of the Hunterian Society, closed with

remarks upon the activities in the City in respect of technical education, scholarship, and scientific research.

Mr. Ivor Back proposed "The Guests and Kindred Societies," coupling with the toast the names of Dr. Walter Carr (President of the Medical Society of London), Sir Squire Sprigge (Editor of THE LANCET), and Dr. W. M. Willoughby, who all briefly replied.

MOORFIELDS ANNUAL DINNER.—The annual dinner of past and present students of the Royal London Ophthalmic Hospital was held at the Langham Hotel on Feb. 7th, when Mr. C. H. Usher, consulting ophthalmic surgeon to the Royal Infirmary, Aberdeen, occupied the chair and 70 students and guests were present. Among the guests of honour were Sir John Rose Bradford, Vice-Admiral Arthur Gaskell, Air Vice-Marshall David Munro, Prof. G. Elliot-Smith, and Mr. Theodore Luling. During the evening the Dean of the Hospital, Mr. C. B. Goulden, presented a report, which showed a record admission of new students—134 as against 121 in 1925. The number of students attending the practice of the hospital was 182, and during the year 406 lectures were given by members of the staff with the assistance of the lecturers in anatomy and physics. Among the examination successes last year were two diplomas of F.R.C.S. Edin. At the final examination for the D.O.M.S. of the Conjoint Board, of the 59 candidates who presented themselves, 48 were students of Moorfields and of the 36 successful candidates, 31 had pursued their studies there. Last year's new departure of inviting extra-mural lecturers to give courses had led to crowded audiences to hear Mr. Traquair lecture on "Perimetry," Prof. Elliot-Smith on "The Optic Connexions of the Brain," Prof. H. Hartridge on "The Resolving Power of the Eye," and Dr. James Kerr on "The Education of the Partially Sighted." The staff of lecturers had been strengthened by the addition of Miss Ida Mann and Mr. W. S. Duke-Elder, in the special departments of embryology and physiology. The Dean remarked that in spite of the generosity of Sir William Lister, who had built for them a small additional lecture room, further space was still needed, especially a lecture room to seat 50 students, an enlarged library, a reading room for students, and new pathological and bacteriological laboratories. He hoped that a place would be found for all of these in the building scheme upon which the hospital was shortly embarking.

CARDIFF MEDICAL STUDENTS CLUB (LONDON BRANCH).—A dinner will be held at Frascati's Restaurant on St. David's Day, March 1st. It is hoped that many of the students of this school now working in London hospitals will be present.

THE Bath Mineral Water Hospital is being enlarged by the addition of 30 beds.

WAITING LISTS AT MANCHESTER.—The Manchester local voluntary hospitals committee has just published its statistical report for the year 1927. It shows that at the close of that year nearly 5000 surgical cases were awaiting admission. The cost of in-patients averaged £7 14*s.*, towards which they contributed an average of £1 3*s.* 8*d.*

CITY OF LONDON TRUSS SOCIETY.—When the lease of this Society's premises in Finsbury-square expires three years hence it is proposed to obtain a site, in the City if possible, for a building in which hospital treatment can be given, it being impossible, for lack of space, to obtain much assistance from the general hospitals. In the meantime an official application for the use of beds is being made to St. Bartholomew's Hospital.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Dr. Hector Cameron will lecture for the Fellowship on Monday, Feb. 25th, on Appendicitis and Other Causes of Acute Abdominal Pain in Children. The lecture will be delivered at the Rooms of the Medical Society of London, Chandos-street, Cavendish-square, W., at 5 P.M., and is free to members of the medical profession. On Wednesday, Feb. 27th, at 4 P.M., at the Wellcome Museum of Medical Science, 33, Gordon-street, W.C., Dr. Gwynyett Gordon will give a clinical demonstration on the leukæmias and Hodgkin's Disease, and at the same time on the same day Dr. Kenneth Playfair will demonstrate cardiac cases at the Royal Waterloo Hospital (both demonstrations free). A week's intensive course begins at the Brompton Hospital for Chest Diseases on Feb. 25th, and at the Hospital for Sick Children, Great Ormond-street, morning course will be held from Feb. 25th to March 9th. Early application is desirable as the course is limited to 20. In March two special courses only will be held, the dates of both being March 11th–23rd. One is an all-day course at the Royal National Orthopædic Hospital (minimum entry, ten), and the other is an ophthalmological course at the Royal Eye Hospital, consisting of instruction in the afternoons. Copies of all syllabuses and information about the general course at the various hospitals affiliated to the Fellowship may be had from the Secretary, at 1, Wimpole-street, London, W. 1.

Obituary.

SIR BERTRAM WINDLE, M.D., D.SC. DUB., F.R.S.

NEWS has reached this country of the death of Sir Bertram Windle, at Toronto, on Feb. 14th, at the age of 70. The Roman Catholic Church loses in him one of its foremost British apologists, and the medical profession is deprived of a man who distinguished himself in more than one field of work.

Born in England to Irish parents, Bertram Coghill Alan Windle was the son of the Rev. S. A. Windle, and grandson, through his mother, of Admiral Sir Josiah Coghill. At the time of his birth his father was vicar of Market Rasen in Lincolnshire, but it was not long before he went back to Ireland as rector of Kingstown, and Bertram attended the local grammar school before going to Repton. At Trinity College, Dublin, which he entered as an undergraduate, he was conspicuous as an agnostic—a circumstance perhaps attributable to his father's vigorous religious views. His academic career was brilliant, and after holding minor posts in Dublin he was appointed pathologist to the General Hospital at Birmingham, where the next 20 years of his life were to be spent. Within 12 months he had joined the staff of the Medical School as professor of anatomy and anthropology, and in the years that followed he was largely responsible for the movement which resulted in the formation of the University of Birmingham. The ability which he displayed as dean of the medical faculty recommended him for the post of principal of Queen's College, Cork, when this fell vacant. Here his energetic administration bore much fruit, and under its new name of University College the institution prospered rapidly. The movement for an independent University of Munster found in Windle an able leader, and legislation to this end had been approved in principle by Dublin Castle when the success of Sinn Fein at the polls put an end to its progress. This was a severe blow to Windle, and in 1919 he resigned his appointment at Cork in favour of the chair of anthropology at St. Michael's College in the University of Toronto, which he occupied at the time of his death.

Whilst at Birmingham, Windle came under the influence of John Henry Newman, and in 1902 he joined the Roman Church. The relation of scientific facts to revealed religion interested him immensely, and this interest was reflected in numerous books and articles. The popularity of his writing extended beyond his own church, and in 1919 the Victoria Institute departed from precedent in awarding to him, although a Roman Catholic, its Gunning Prize for one of the two best books defending revelation—namely, "The Church and Science." On anthropology and anatomy he was also a considerable writer, whilst a number of books on history and the associations of the countryside testified to a many-sided personality and a capacious mind.

Sir Bertram Windle, who was knighted in 1912, sat on the General Medical Council from 1900 to 1905 as representative of Birmingham University, and from 1914 to 1920 as representative of the National University of Ireland. He acted from time to time as examiner in anatomy to the Universities of Cambridge, Aberdeen, Glasgow, and Durham, and was elected to the Royal Society as a young man. His merits were recognised by the grant of honorary degrees by the Royal University of Ireland and by Birmingham, Boston, and Marquette Universities. Pope Pius X. created him a Knight of the Order of St. Gregory the Great, and Pope Pius XI. conferred on him the degree of Doctor of Philosophy. He was twice married, and leaves a daughter.

SIR JAMES HOSKER, M.R.C.S. ENG., J.P.

BOURNEMOUTH has lost a notable public figure by the death from influenza on Feb. 13th of Sir James Hosker, in his seventy-third year. He had been closely associated with municipal activities of all kinds there for nearly 50 years.

James Atkinson Hosker was the son of James Hosker, of Liverpool. Born in 1857 he was educated privately and at the London Hospital. After qualifying M.R.C.S. in 1882 he was the first resident house surgeon at the Royal Boscombe (later Royal Victoria) and West Hants Hospital, with which his connexion was lifelong, for he was appointed to the honorary staff in 1884, and on his retirement as senior surgeon in 1903 he was elected hon. consulting surgeon. It was not merely in a professional capacity that he served the hospital; he was for long its hon. secretary, and helped largely to relieve the hospital from its financial straits. His municipal work began in 1890, when on the Incorporation of the Borough he was elected a councillor of the Boscombe ward, becoming alderman in 1894, and mayor in 1896, after which he acted as chairman of the sanitary committee. Before this he was a member of the Hants County Council. He sat for 30 years on the local bench of magistrates, and his colleagues in recording their regret at his death testified to his "directness of purpose, kindness of heart, and the certainty of justice" which he administered. He was an active politician, and all through his life closely associated with the Bournemouth Conservative Association, of which he was first hon. secretary and then chairman. A keen Freemason, he founded the London Hospital Lodge, and was a member of the Grand Lodge of England. In his spare time he was a breeder of fox-terriers, and became something of an international judge of dogs. He was a familiar figure on the Queen's Park Golf Club, of which he was captain for a time, and he was the first local president of the Yorkshire Society. His love of dogs and horses led him to resent the coming of the petrol-driven vehicle, and for long after his colleagues went about in cars he was to be seen in his familiar brougham drawn by chestnut horses.

Sir James Hosker married, in 1887, Constance Georgina, second daughter of Captain George Newcomen, R.N., who survives him without issue.

WE regret to record the death of Dr. ROBERT KINNEAR HAY GILLESPIE, at his home in Leeds, on Feb. 13th. Dr. Gillespie had a distinguished career as a student at Glasgow University, gained many awards of merit, including the John Hunter medal in surgery, and graduated as M.B. in 1915. For a short time he served as a resident medical officer on the staff of the Glasgow Royal Infirmary. Thereafter he joined the Royal Army Medical Corps, and was posted to Salonica, where he served until he was invalided home in 1918. Appointed on his return to the East Leeds War Hospital, he was subsequently transferred to the War Hospital at Beckett's Park, Leeds. He joined the staff of the Ministry of Pensions when the latter hospital came under the control of the Ministry in 1920, and remained in the pensions service until 1927. In September of that year he entered into private practice in the Headingley district of Leeds, and rapidly gained the confidence and liking of a large circle of patients. In the Army, and later in the Ministry of Pensions, Dr. Gillespie gave ungrudgingly of his abounding energy, and many disabled ex-Service men will remember him, not only as a skilful and attentive surgeon, but also as a friend and adviser. His chief hobby was engineering, and his manipulative dexterity was manifest not only in the operating theatre but also in the training workshops of the various hospitals to which he was attached. His strong and engaging personality brought him many friends, who sincerely regret his death at the early age of 37. He married in 1922, and is survived by his widow.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, W.

THURSDAY, Feb. 28th.—4.30 P.M. A meeting for discussion will take place on the subject: Ultra-microscopic Viruses Infecting Animals and Plants. The discussion will be opened by Sir Charles Martin, F.R.S.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Feb. 25th.—8 P.M., ODONTOLOGY. Mr. W. Kelsey Fry: Fractures of the Mandible in, and Posterior to, the Molar Region. Casual Communications: Mr. W. Rushton: The Use of Cement Linings in Cavities. Dr. J. Kingston Barton: The Prevention of Diseases of the Teeth in Children. Mr. F. N. Doubleday: Fractured Roots of Central Incisors with Live Pulps.

TUESDAY.—5 P.M., MEDICINE. Prof. K. Hansen (Heidelberg): The Psychical and Allergic Factors in Asthma. A short discussion will follow.

THURSDAY.—5 P.M., UROLOGY. Pathological Evening.

FRIDAY, March 1st.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.). Subject for Discussion: The Acute Ear. Short papers by Mr. Herbert Tilley, Dr. Dan McKenzie, Mr. F. F. Muecke, and Mr. C. A. S. Ridout. Mr. J. S. Fraser and Mr. E. D. D. Davis: Microtia and Atresia of the External Meatus. Demonstration: Mr. A. Lowndes Yates: Methods of Taking Records of Instability. Cases will be shown by Sir James Dundas-Grant, Dr. Dan McKenzie, and others. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Cases and Specimens will be shown by Mr. H. Bell Tawse, Mr. Jefferson Faulder, Mr. Lionel Colledge, Dr. Dan McKenzie, Mr. Wm. Mollison, and Mr. A. J. Wright. 8.30 P.M., ANÆSTHETICS. Paper: Dr. Gerald M. Slot: Deaths under Anæsthetics with Special Reference to their Pathology.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Feb. 25th.—8.30 P.M., Discussion on Acute Intestinal Obstruction, to be introduced by Prof. A. H. Burgess, followed by Mr. C. H. S. Frankau.

WEDNESDAY.—9 P.M., Dr. H. W. Barber: Dermatology in Relation to Other Branches of Medicine. (Second Lettsomian Lecture.)

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.

WEDNESDAY, Feb. 27th.—4 P.M., Clinical Cases. 5 P.M., Dr. Tylecote: Paper on Calcium. The Meeting will be followed by a Dinner to be held at Kettner's at 6.45 for 7 P.M.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

MONDAY, Feb. 25th.—8 P.M., Sir Thomas M. Legge: Thirty Years' Experience of Industrial Maladies. (Second Shaw Lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, Feb. 26th.—5 P.M., Dr. J. Graham Forbes: Past and Present Diphtheria in England and Wales with special reference to the London Metropolis. (First Milroy Lecture.)

THURSDAY.—5 P.M., Dr. J. Graham Forbes. (Second Milroy Lecture.)

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Feb. 25th.—5 P.M., Mr. P. Eggleton: The Chemistry of Muscle Contraction.

TUESDAY.—5.30 P.M., Dr. Percy Stocks: Recent Work on the Genesis of Epidemics.

WEDNESDAY, THURSDAY, and FRIDAY, March 1st.—5 P.M., Dr. J. H. Burn: The Properties of, and Methods of Estimating, some Therapeutic Agents.

FRIDAY, March 1st.—5.30 P.M., Dr. J. Howard-Jones: The Hygiene of the Mercantile Marine. (Second lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 25th, to SATURDAY, March 2nd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., Feb. 25th, at 5 P.M., Lecture by Dr. Hector Cameron: Appendicitis and Other Causes of Acute Abdominal Pain in Children.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M., Demonstration by Dr. Knyvett Gordon, The Leukæmias and Hodgkin's Disease.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Wed., 4 P.M., Clinical Demonstration by Dr. Kenneth Playfair. (Heart Cases.)—The above are free.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Special post-graduate course in Dermatology. Every afternoon, clinical instruction: lectures twice weekly. Proportionate fees. Pathological demonstrations can be arranged.—BROMPTON HOSPITAL (For Chest Diseases), S.W. Intensive Course, one week.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Morning course, two weeks. Further particulars from the Secretary of the Fellowship of Medicine.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Feb. 26th.—3.15 P.M., Dr. Rubens Wade: Anæsthesia.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Feb. 26th.—5 P.M., Dr. G. B. Dowling: Seborrhœa. Seborrhœic Dermatitis.

THURSDAY.—5 P.M., Dr. W. K. Sibley; Electrotherapeutics.

ORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Feb. 25th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.
FRIDAY, March 1st.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 25th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Adie: Progressive Muscular Atrophies.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Neurosyphilis.
THURSDAY, 2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Common Lesions of Peripheral Nerves.
FRIDAY, March 1st.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Sir Percy Sargent: Cerebellar Tumours.

OSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 28th.—4 P.M., Dr. Tyrrell Gray: Undescended Testes.

ATIONAL COUNCIL FOR MENTAL HYGIENE, 78, Chandos House, Palmer-street, S.W.
WEDNESDAY, Feb. 27th.—5 P.M. (at the Medical Society of London, Chandos-street, W.), Dr. W. A. Potts: The Irrisistible Impulse.

NCOATS HOSPITAL, POST-GRADUATE LECTURES, Mill-street, Manchester.
THURSDAY, Feb. 28th.—4.15 P.M., Dr. Kletz: Diseases of the Gall-bladder.

ANCHESTER ROYAL INFIRMARY.
TUESDAY, Feb. 26th.—4.15 P.M., Mr. G. Jefferson: Treatment of Neuralgia.
FRIDAY, March 1st.—4.15 P.M., Mr. P. R. Wrigley: Demonstration of Surgical Cases.

NIVERSITY OF LIVERPOOL.
THURSDAY, Feb. 28th.—4 P.M. (in the Surgery Theatre of the Medical School), Mr. H. A. T. Fairbank: Congenital Dislocation of the Hip, with Special Reference to the Anatomy. (The Lady Jones Lecture.)

NIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, March 1st.—3.30 P.M. (at the Royal Hospital), Dr. Skinner: Neurological Cases.

Appointments.

ONES, MARY, M.B., Ch.B. Edin., has been appointed Assistant Medical Officer at the Union Hospital, Fulwood.
ICK, H. E., M.B., B.S. Lond., F.R.C.S. Eng., an additional Referee under the Workmen's Compensation Act for Ophthalmic Cases in Circuit 31, Aberayron, &c.
USSELL, BEDFORD, F.R.C.S. Eng., Assistant Surgeon to the Throat Department, St. Bartholomew's Hospital, and Honorary Surgeon to the Golden-square Throat, Nose and Ear Hospital.
AYLOR, W., M.D., Ch.B. Aberd., D.P.H., Medical Officer of Health for Shropshire.
rtifying Surgeons under the Factory and Workshop Acts: MACLACHLAN, C. F., M.B., Ch.B. Edin. (Lockerbie, Dumfries); ELLISON, H. H. L., L.R.C.P. Lond., M.R.C.S. (Syston, Leicester).

Vacancies.

For further information refer to the advertisement columns.

r County Hospital.—Sen. H.S. At rate of £100. Also Jun. H.S. £80.
rrow-in-Furness, North Lonsdale Hospital.—H.S. £130.
rmingham, Queen's Hospital.—Anæsthetist. H.P.'s., H.S's. and Cas. H.S. Each at rate of £70.
ighton, Royal Sussex County Hospital.—Cas. H.S. £120.
stol General Hospital.—H.P.'s. H.S.'s. Res. Obstetric Officer. Also Cas. H.S. Each at rate of £80.
stol Royal Infirmary.—H.P.'s, H.S.'s., Dental H.S., &c. Each at rate of £80.
ydon General Hospital.—Cas. H.S. £125.
rby, Derbyshire Education Committee.—Asst. School, M.O. £600.
chester, Dorset Mental Hospital.—Sen. Asst. M.O. £400.
rham County Council Education Department.—Asst. Oculist. £600.
t African Medical Service.—M.O.'s and Health O.'s. £600 and £660 respectively.
t Ham Memorial Hospital, Shrewsbury-road, E.—Hon. Asst. P.
ex, Administrative County of.—Asst. County M.O.H. £600.
ucester, Gloucestershire Royal Infirmary.—2nd H.S. At rate of £100.
rogate Infirmary.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.
tford County Hospital.—Res. Surg. O. At rate of £250.
Islington Dispensary, 303, Upper-street, N.—Sen. Res. M.O. £300.
Jerusalem, St. John Ophthalmic Hospital.—Sub-Warden.
Kensington, Fulham and Chelsea General Hospital.—Hon. Phys. for Diseases of Skin.
Leeds, St. James' Hospital.—H.P. and S. £200.
Liverpool County Borough.—Jun. Asst. School M.O. £600.
Leicester, Royal Infirmary.—H.S., Res. Cas. O. Also H.P. Each £125.
Liverpool, Mill-road Infirmary, Everton.—Res. Asst. M.O. £200.
London Temperance Hospital, Hampstead-road, N.W.—Hon. Anæsthetist.
Manchester, Ancoats Hospital.—Res. Surg. O. Also H.S. At rate of £100.
Manchester Ear Hospital.—Non. Res. H.S. Also H.S. At rate of £150 and £120 respectively.
Manchester, Royal Children's Hospital.—Two Asst. M.O.'s. Each at rate of £150. Also Res. M.O. and Res. Surg. O. Each at rate of £125.
Maudsley Hospital, Denmark Hill, S.E.—Asst. M.O. £300.
Metropolitan Asylums Board, Mental Hospital Service.—Sen. Asst. M.O. £650.
Metropolitan Ear, Nose and Throat Hospital, Fitzroy-square, W.—H.S. £150.
Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. M.O., Cas. O., and H.P. At rate of £250, £150, and £125 respectively.
Northampton General Hospital.—Two H.S.'s. Also Asst. H.S. Each at rate of £150.
Paddington Green Children's Hospital, W.—Hon Physician. Also H.P. and H.S. Each at rate of £150.
Perth, James Murray's Royal Asylum.—Asst. Physician. £300.
Queen's Hospital for Children, Hackney-road, E.—Res. M.O. £200.
Reading, Royal Berkshire Hospital.—Hon. M.O. for Electro-Therapeutic Departments.
Rotherham Hospital.—H.P. £180.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—H.S. Also H.S. for Country Branch at Stanmore, Middlesex. Each at rate of £150.
St. Mary's Hospital for Women and Children, Plaistow, E.—Clinical Asst.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £175.
Stepney Parish Guardians' Hospitals.—Consultant Surgeon. £350. Consultant Physician and Consultant Ophth. Surgeon. Each £200. Also Consultant Surgeon for Ear, Nose and Throat. £150.
Sudan Medical Service.—M.O. £E.852.
Surrey, Administrative County of.—County M.O.H. £1800.
Surrey, County Council.—Asst. M.O. £600.
Swansea, Adelina Patti Hospital, Craig-y-Nos.—Asst. Res. M.O. £250.
Swansea Hospital.—H.S. Also H.P. Each £150.
Throat, Nose, and Ear Hospital, Golden-square, W.—H.S. £100.
Torquay, Torbay Hospital.—H.S. £175.
Wallasey, Victoria Central Hospital.—Jun. H. S. At rate of £100.
West London Hospital, Hammersmith-road, W.—Hon. Asst. Anæsthetists.
Western Ophthalmic Hospital, Marylebone, W.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.
Westminster Hospital.—Medical Registrar.
Willesden General Hospital, Harlesden-road, N.W.—Clin. Asst.

Births, Marriages, and Deaths.

BIRTHS.

DE JERSEY.—On Feb. 11th, at Audley House, Swanage, the wife of Dr. G. W. S. de Jersey of a daughter.
DENNEHY.—On Feb. 12th, at a nursing home, Northgate, Bury St. Edmunds, the wife of Dr. J. J. Dennehy, of a son.
MACKINTOSH.—On Feb. 14th, at Kenilworth, Stoneygate-road, Leicester, the wife of Dr. J. M. Mackintosh, of a daughter.
WATERSTON.—On Feb. 13th, at Langroyd, Colne, the wife of Dr. G. Fyfe, Waterston, Deloraine, Windermere, of a son.

MARRIAGES.

GORDON—ROBERTSON.—On Feb. 11th, at St. Paul's, Knightsbridge, Hugh Walker Gordon M.C., M.R.C.P to Jean Helen. eldest daughter of Mr. and Mrs. H. W. Robertson, of Fintry, Brook, Godalming, Surrey.

DEATHS.

BEYTS.—On Feb. 12th, at Queen Alexandra's Military Hospital, Millbank, London, Colonel William George Beyts, C.B.E., R.A.M.C. (retired), Medical Officer of the Tower of London.
GILLESPIE.—On Feb. 13th, at Beech House, Otley-road, Leeds, Dr. Robert Kinnear Hay Gillespie, M.B., Ch.B. Glasg., aged 37.
HUME.—On Feb. 12th, at Vron, Bangor, N. Wales, Douglas Walter Hume, M.B., B.S. Lond., F.R.C.S. Eng., aged 47.
RUTTLEDGE.—On Feb. 16th, at Alpha-villas, South Farnborough, Colonel William Frederick Ruttledge, late R.A.M.C., aged 91.
WINDLE.—On Feb. 14th, at Toronto, Canada, from pneumonia, Sir Bertram Windle, F.R.S., LL.D., M.D., aged 70.
WOODD WALKER.—On Feb. 9th, in London, Basil Woodd Walker, M.D., of 6, Dawson-place, W., aged 73.

POCKETT.—In ever loving memory of Lieut.-Col. L. W. Pockett, M.D., M.R.C.S., L.R.C.P., L.S.A., who entered into rest Feb. 18th, 1928. From his wife and daughter.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE PANEL SYSTEM IN BIG TOWNS.

To the Editor of THE LANCET.

SIR,—I am a practitioner in a good street in the south-western district of London. Two maids have been with us for many months and, assuming that they were on the panel, I have systematically paid the whole 1*s.* 2*d.* per week myself. A fortnight ago one of these women was seized with an acute attack of influenza. She was put to bed, and I offered to send for her panel doctor. She said that she had none, and never had had. Accordingly I rang up an acquaintance who runs a panel, and asked him to see the maid and take her on his panel. It was a Sunday morning, and he refused to come. I tried six other panel doctors, not one of whom would come. At last I prescribed for her myself, and sent the prescription to the nearest chemist to be made up for a panel patient. The chemist refused to dispense the medicine. He said that panel dispensing did not pay him, and I had better send to a chemist, a considerable distance off, who did a large amount of panel work. This chemist I found did not open at all on Sundays. Eventually I had to pay for the medicine myself at the first chemist's establishment. These bare facts seem to me to indicate need for improvement in matters of panel practice. I am informed that for numbers of servants, who are on the panel, their employers not only pay the insurance but, when illness comes, call in their own medical men. So far as my own observation goes it appears that in country districts the panel system works well and honestly. In towns, it seems, the panel doctor may reap the fees while other doctors do the work on their patients. I enclose my card.

I am, Sir, yours faithfully,

AGGRIEVED.

*** The provision of facilities for dispensing medicine to insured patients has always been rendered difficult by early closing and the fact that many chemists have lock-up premises, but in most areas of South London there is a rota of chemists who undertake in turn to be on duty late at night and on Sundays. This is certainly an arrangement which should prevail elsewhere. It seems, however, that the chemist who was approached and was actually available was not at liberty to dispense for an insured person except on presentation of the official form used by doctors on the panel. For the rest, "Aggrieved's" grievance is real enough, for he was certainly the victim of careless improvident maids who, although entitled to medical benefit, had obtained no medical cards, or who had not troubled to get their cards signed by a practitioner on the panel. We have repeatedly emphasised the point, and we do so again, that it is largely the ignorance of the insured population in regard to their rights and duties under the medical benefit provisions of the Insurance Acts that hinders these Acts from fully developing their beneficent purpose. It should be construed by every insurance committee as part of its duty to make known the provisions of the Acts in an effective way to every class of insured person. Domestic servants badly need this information.—ED. L.

BRUCELLA ABORTUS IN MAN.

As recently as Dec. 29th (THE LANCET, 1928, ii., 1335, 1338) we published reports of the occurrence of *Brucella abortus* in human beings, and two further case-reports appear in our columns this week. We therefore take the opportunity of informing interested readers that the December issue of the *Giornale di Clinica Medica*, which has just reached us from Parma, is wholly devoted to undulant fever. Besides original papers it contains a bibliography of some 30 pages.

ETHER AND DUTY-FREE SPIRIT.

IT has been pointed out to us that in an annotation published in THE LANCET of Feb. 9th, 1929, p. 295, an incorrect impression may have been gained from the words in which the provision is described of pure ethylic ether at the price hitherto charged for that derived from methylated spirit. The circumstances are as follows. As far back as 1923 the Association of British Chemical Manufacturers made representations to the Commissioners of Customs and Excise concerning the disadvantages arising in the manufacture of ether from the use of methylated spirit. As a sequel to discussion of these circumstances, The British Drug Houses, Ltd. themselves approached the Customs and Excise for permission to employ special denaturing agents other than methyl alcohol when the preparation of anæsthetic ether was in question. The privilege was granted in 1926 that such special denaturing agents could be employed, and it was made openly

(*Continued at foot of next column.*)

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 374.*)

THE following official bulletin has been issued signed by Sir Stanley Hewett and Lord Dawson o Penn :—

FRIDAY, FEB. 15TH.

In spite of the inclement weather His Majesty th King continues to make slow progress, and since hi departure from London has increased in weight.

(*Continued from previous column.*)

available to all manufacturers of ether, but The British Dru Houses, Ltd. appears to have been the only firm that too advantage of it. At any rate, from that date all ethe manufactured by that firm has been prepared from duty-fre alcohol without the use of methylated spirit, so that th committee set up by the Medical Research Council and th Royal Society of Medicine have acted in accordance with special permission already granted, although only take advantage of by one firm ; and we have here not so much a innovation as a sequel.

COLD SHOPS AND SICKNESS CLAIMS.

IN a recent letter to the press Mr. J. R. Leslie, J.P general secretary of the National Amalgamated Union Shop Assistants, Warehousemen, and Clerks, points ou that under the provisions of the Factory Acts, workroom and factories have to maintain "a reasonable temperature, but unfortunately there is no legal provision in this respe for shops. The Union has an approved society under th National Health Insurance scheme with a membership 35,000, among whom the normal sickness claims per wee range from 800 to 1000. Last week these claims ran up t 1749. In the trade-union department the normal sickne claims among a provident membership of 25,000 averag 500 per week. Last week the claims reached 925. The bul of the sickness certificates are for influenza, some f "severe cold," and a number for bronchitis. Each winte whenever there is a spell of very cold weather, the clain increase largely. There is no doubt, Mr. Leslie think that the conditions under which many members of th Union work—shops with open doors, without fires or heatin of any description, cold marble slabs, everything they hand cold—have a bad effect on their health. Many of the girl he adds, suffer severely from chilblains.

AN ELECTRICALLY HEATED CUSHION.

WE have received from Thermega, Limited (manufacture of Electrical Appliances, 53, Victoria-street, London, S.W.1 a sample of an electrical heating pad for local applicatio The pad is a smaller variety of the Thermega blanket whic has been on the market for some time and is well establishe in practice, especially at sanatoria and places where childre are nursed under open-air conditions. The heating cushio or pads are supplied in two sizes, the larger one bein 16 inches by 12, the smaller two inches less in each dime sion. They can be used on any current between 100 an 250 volts without adjustment, warming up quickly wh the current is turned on, and not overheating owing to device known as the Birka tempe ature regulator whic automatically switches off the current when the desire temperature is reached. The small size gives in use a co stant heat of 120° F. ; the larger model can be regulate at will to give 90°, 120° or 150° F. The cost in current is le than one-quarter of a penny an hour, even if the unit char is 6*d.* The pads are intended for the local application heat and the relief of pain in such conditions as rheumatis sciatica, and pleurisy, and we can testify to the relief afford in the case of an aching joint. The price of the cushion 21*s.* for the small, 33*s.* for the larger size, extras being indiarubber cover for use with a wet compress and a great length of flexible conductor.

Andrew Lang's Birthplace as a Nursing Home.—Vie field, Selkirk, the birthplace and early home of Andre Lang, has been bought by the Selkirk Cottage Hospit Association for a nursing home.

Ski-ing Accidents.—In Dr. Knoll's article, which appear in our last issue, torsion fractures of the metacarpal bon should have been described as very frequent in *subalpi regions* (not Central Switzerland). Line 15 in the paragra on the Common Injuries should read : The fall therefo is its consequence, not its cause.

An Address

ENTITLED

DEVIATIONS FROM THE STANDARD.

Delivered before the Interstate Post-Graduate Medical Association of North America

BY O. LEYTON, M.D. CAMB., D.SC., F.R.C.P. LOND.,
PHYSICIAN TO THE LONDON HOSPITAL.

ENGLISH workers recognise that the United States has made enormous advances in the study of medicine, and the authorities of the larger hospitals realise their responsibility in bringing these advances to the aid of the suffering poor in the wards of their institutions. To facilitate this they favour sending qualified men and hospital nurses, when opportunity offers, over to the States to carry out research work and study the methods there elaborated. When these visitors return they often bring with them heaves of tables based upon the average or standard. These tables are of great value in the hands of the experienced, but those who have little opportunity of using them tend to exaggerate their value and raise them to an importance second only to those tablets which Moses brought down from Mount Sinai.

INDIVIDUAL PECULIARITIES.

I should like to draw attention to a deviation from the standard which in the past has led me and others astray and made us diagnose disease when none has been present. Sometimes, not always, it is easy to arrive at the average or standard, but extremely difficult to define what deviation from that standard is an individual peculiarity and to distinguish that from an illness. At first sight it seems to me that the more accurate the apparatus we possess the greater the difficulty. For instance, before we possessed clinical thermometers there must have been little difficulty in deciding whether a patient was feverish or not. The flushed face, the hot skin, the rapid pulse, and perhaps delirium, led the experienced physician to a definite conclusion. A short time ago I asked some of my colleagues at what temperature they thought pyrexia began; one replied, at 99·6° F., and another at 101° F. If the accepted definition of "truth" be "that which satisfies," then neither of my colleagues was speaking the truth. It would not be wise to say that a man was feverish because his temperature was 100·4° F. after exercise; as you know, the temperature of most of us will rise to that height if we run a mile. Nor would it be wise to say that a man with a temperature of 99·6° F. is not feverish in certain circumstances. These difficulties in definition give us food for reflection, but are comparatively simple when compared with individual peculiarities; most of us have met healthy people whose normal temperatures have been 97·6° F. or below. These are not arguments against the use of accurate instruments, but illustrate that, although it may be quite easy to define the normal average or standard, it is extremely difficult to decide what deviation from the standard is important.

Let me take one other illustration with which you are all well acquainted—the blood pressure. Perhaps it would be more accurate for me to say the pressure in a bag 4 in. wide which, when applied to the upper arm, will obliterate the pulse at the elbow. Most of the instruments in use to-day do not measure the systolic pressure, a fact which can be shown quite rapidly and clearly by applying a plethysmograph to the forearm; it will be found that the volume of the arm increases whilst the bag is supposed to be just obliterating the artery. What is the "standard blood pressure"? Some assert that when it is measured in millimeters of mercury it is the age in years added to 100. It is now more than 30 years ago that I first took a blood pressure measuring apparatus into a ward of a hospital, and during that time I have seen more and more importance attached to its readings. To-day many patients come to the physician stating that they are suffering from "blood pressure." When I am faced with this diagnosis I inquire whether the patient has any symptoms, or whether the diagnosis is based entirely upon the fact that the blood pressure apparatus records a pressure higher than the average. In the latter case many tests must be carried out before the diagnosis of disease is pronounced. I can call to mind a very wonderful old lady, the widow of England's most famous biologist, who for the latter ten years of her life had a systolic blood pressure measured by the Riva Rocci apparatus of over 280 mm. of mercury. The only symptom that developed was a minute hæmorrhage into one eye, and at the age of 87 she died from a condition which, as far as we know, has no relation to blood pressure. No doubt many of you have seen cases somewhat similar, and also the reverse; blood pressures of 125 mm. in patients of 70 years and more who have been hale and hearty and shown no evidence of myocardial disease. I suggest that there should be different standard blood pressures in different States, for it is difficult to believe that the same average pressure occurs in Alaska as in Georgia. An average blood pressure in a country that reaches almost from the Equator to the Pole seems to me to be of little more value than an average skin-colour for the inhabitants of the State of Georgia.

LOW RENAL THRESHOLD FOR SUGAR.

Many years ago the diagnosis of diabetes mellitus followed the reduction of Fehling's solution by the urine; later it was recognised that many substances besides dextrose reduced Fehling's solution, such as pentose, lævulose, lactose, glycuronic acid, and several others. It is doubtful whether many errors in diagnosis were made in these early days, because the urine at that time was only examined for sugar when thirst, polyuria, &c., suggested disease. Later the diagnosis of diabetes mellitus was reserved for true glycosuria, and then Saloman showed that individuals might pass dextrose in the urine without the sugar in the blood rising above the normal average. He called this condition "renal glycosuria," because his first few cases had albuminuria in addition. It is now recognised that the peculiarity is not of the kidney, and the name was replaced first by that of diabetes innocens, which is a bad name because there is no diabetes—in other words, no thirst and no polyuria. Many call the condition orthoglycæmic glycosuria, whilst I suggested the name of "negligible glycosuria," because it is not of importance. A very pronounced case of this peculiarity came my way several years ago. After the administration of 50 g. of dextrose by the mouth the sugar in the urine rose to over 10 per cent., although the sugar in the blood did not exceed 0·16 per cent. (Fig. 1). These numbers seemed so unusual that I thought it wise to have them confirmed at two laboratories by different observers. Not only is the renal threshold different for different individuals, but it varies from time to time in the same individual. Some time after a meal it tends to fall. A boy of 14 was given 50 g. of dextrose by the mouth after a meal containing considerable quantities of carbohydrate (Fig. 2). The concentration of the sugar in the urine rises whilst that in the blood falls, even if we take into consideration the residual urine of the pelvis of the kidneys and ureters.

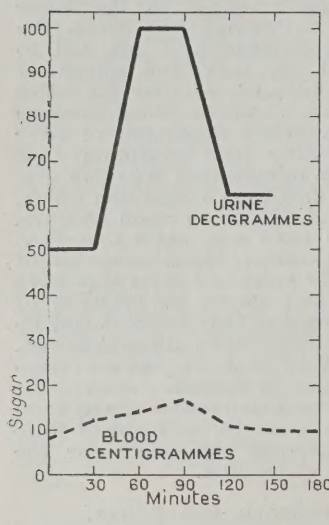
Many others have made similar observations, amongst them the distinguished expert on diabetes mellitus, Dr. J. E. Paullin of this city.

In my experience this peculiarity of a low renal threshold for sugar does not protect from diabetes mellitus. I have seen one case of a man with a low renal threshold develop diabetes mellitus, and amongst my cases of diabetes mellitus nearly 0·5 per cent. have a low renal threshold. Since Dr. E. P. Joslin has never seen diabetes mellitus develop

in an individual with a low renal threshold, there must be some difference in the people on the two sides of the Atlantic.

One case made a great impression upon me—a military man who was getting on in years and who developed thirst, lost weight, and had glycosuria and hyperglycæmia. When placed upon a diet and given insulin the concentration of sugar in his blood was kept between 0·08 per cent. and 0·16 per cent. throughout the 24 hours, but in spite of that he passed quite a lot of sugar in his urine. One day he said to me: "I believe you are giving me monkey gland, not insulin, because there is still sugar in my urine; but, undoubtedly, I am feeling very much better, and now, when I walk down Bond-street, I am interested in seeing what is under the hats." This patient had to be taught how to estimate the sugar in his blood in order that he might take an intelligent interest in his complaint.

FIG. 1.

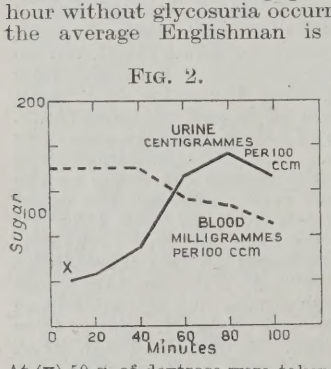


This peculiarity of low renal threshold for sugar seems to be inherited and may perhaps have some relation to diabetes mellitus. Many of the cases in which I have found a low renal threshold for sugar are children of parents with the same peculiarity, whilst four have diabetic parents. I have seen two sisters, daughters of a diabetic mother, one with true diabetes mellitus and the other with a low renal threshold for sugar. This family failing has been worked out very fully by Dr. Urban Hjärne.[1]

THE STANDARD RATE OF BURNING AND/OR STORING CARBOHYDRATE.

Many years ago R. T. Woodyatt, W. D. Sansum, and R. M. Wilder showed that after a fast of 24 hours a healthy man might have dextrose poured into his veins at the rate of 0·8 g. per kg. of body-weight per hour without glycosuria occurring. In my experience the average Englishman is not so competent a kataboliser of sugar. Although my experience of the intravenous method of introduction of sugar has convinced me that it is the more accurate, because it eliminates the error due to different rates of absorption through the intestinal tract, nevertheless I have been forced to make most of my observations after oral administrations, because many of my patients have never entered hospital. I have devised the following method for determining the rate at which sugar is burnt and/or stored.

FIG. 2.

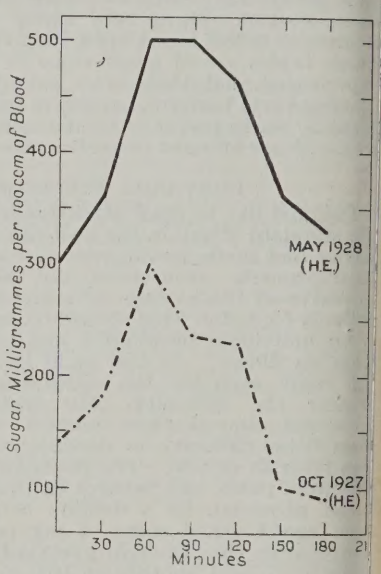


At (x) 50 g. of dextrose were taken by mouth after a meal containing carbohydrate.

After a fast of 12 hours the patient's blood is taken and the sugar in it estimated. Then he receives a definite dose of grape-sugar, dissolved in water and flavoured with lemon-juice. The dose depends upon the concentration of sugar in the blood after the 12 hours' fast; if it be low, 60 g. of sugar are given; if it be high, as little as 20 g. may be considered the best dose. If too big a dose be given, the test would be prolonged over too many hours. At intervals of half an hour or less samples of blood are collected and the bladder is emptied; all the urine is kept. The test in continued for at least three hours.

By estimating the sugar in the samples of blood, one is able to determine how long it has taken for the sugar in the blood to fall to 0·12 per cent., or to what it was before the sugar was administered. Having found this time, the urine passed during that period is mixed, measured, and the sugar and urea in it estimated. The quantity of sugar is subtracted from the dose given, whilst the amount of sugar which may have been liberated from the protein which has been broken down is added. This latter figure is arrived at by multiplying the urea excreted by 1·7. Some may criticise me adversely for adding this quantity, saying that it is far from certain that in the metabolism of a healthy man the carbohydrate part of the protein molecule is at any time converted into dextrose. I admit this, but meet the criticism by drawing attention to the fact that when the efficiency of carbohydrate metabolism is good, then the addition of this liberated sugar makes but little difference in the result, while, when the carbohydrate metabolism is poor, then there is no doubt that the greater part of the carbohydrate liberated is actually turned into dextrose.

FIG. 3.



Observations upon a number of healthy individuals and individuals with low renal threshold show that about 60 g. of dextrose can be stored and/or burnt per hour when administered by mouth. This method measures fairly accurately and is therefore comparable with the thermometer and sphygmomanometer. It allows one to note the progress of a patient by repeating the test at intervals, and for this reason, in my opinion, it is of very great diagnostic importance.

An untreated case of diabetes mellitus may go downhill rapidly.

Fig. 3 shows the curves from a patient who had a mild glycosuria and a low renal threshold for sugar which was discovered when he attempted to insure his life shortly after an operation. I decided that the depression of his carbohydrate metabolism might be due to a recent anæsthetic, anxiety, and poor general health, and advised him to take a holiday and return for further examination in four weeks' time. He did not take a holiday nor did he present himself until six months had passed, and during that time the disease had made great progress. The carbohydrate metabolism efficiency had fallen from 55 per cent. to 24 per cent.

The question arises as to what fall in carbohydrate metabolism constitutes disease. Whenever a tissue alters slowly the time at which disease begins is not a fixed hour; different observers would give different times. Hyperthyroidism may progress quite far in a phlegmatic individual before it appears to become a disease, whilst a very slight increase in the activity of the thyroid gland in a "live wire" would show itself definitely and immediately. Many years ago the diagnosis of diabetes mellitus was comparatively easy because the disease was not recognised until thirst, glycosuria, and wasting were present; now the diagnosis is far from simple. Perhaps the time has come when the name of the disease should be changed, because the diagnosis

[1] See THE LANCET, 1928, i., 1077.

of the complaint may be made before there is thirst or polyuria and before there is persistent glycosuria. Hypoglycopyresis, although cacophonous, conveys the meaning that the power of burning sugar is depressed; when that depression is due to pancreatic disease the term subinsulism seems appropriate. At the present day the diagnosis of diabetes mellitus should be reserved for patients who either present symptoms or are unable to katabolise more than 25 per cent. of the normal average of sugar or are gradually losing the power of katabolising carbohydrate.

Illustrative Cases.

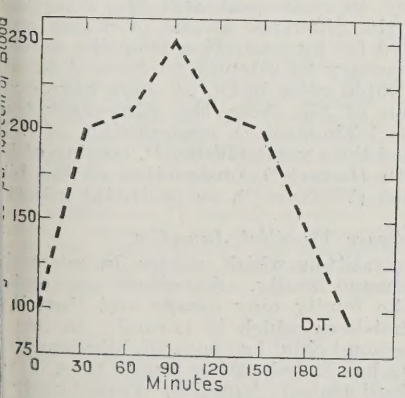
To show that these limitations are necessary I refer to cases which in the past would have been diagnosed as diabetes mellitus, but which, in my opinion, are simply cases of a congenital carbohydrate metabolism considerably below the average.

A woman of 31, had nursed her brother for diabetes mellitus; she examined her urine and found that it reduced Fehling's solution. She went upon a diet and, later, was sent to me for investigation. I found that her renal threshold was low, in the region of 0·16 per cent., but in addition to that the sugar in her blood rose to 0·20 per cent. after a lunch consisting of meat, vegetables, and ice-cream. After breakfast, including marmalade, the sugar in her blood did not rise above 0·12 per cent. The explanation of this, I think, may be pancreatic fatigue. When she was submitted to a carbohydrate metabolism efficiency test the sugar in her blood rose to 0·25 per cent. and took quite a long time to fall. She proved to have a carbohydrate efficiency of 33 per cent. (Fig. 4). This is considerably worse than that of the case of diabetes mellitus referred to above (Fig. 5).

Her brother was submitted to similar tests, and his carbohydrate metabolism efficiency was found to be a little lower than that of his sister. These two patients had not had symptoms of diabetes mellitus, but the male had had intermittent glycosuria for some years. After due consideration of the circumstances, which were quite exceptional, I came to the conclusion that I was justified in advising these two patients to eat and drink whatever they liked for a year and then be submitted to similar tests again. This was done, and their efficiency was found to be somewhat better rather than worse.

There are so many possible explanations for this improvement that it would be but a waste of time to discuss them here. I came to the conclusion that these patients were not suffering from diabetes mellitus, although their power of burning and/or storing sugar was much less than the average. If anyone prefers to take the view that the two patients were cases of mild non-progressive diabetes mellitus, which obviously needs no treatment, I shall be the last person to contradict him because his definition of illness will be different from mine, and it is useless for two people to argue when they do not attach the same meaning to one another's words.

FIG. 4.



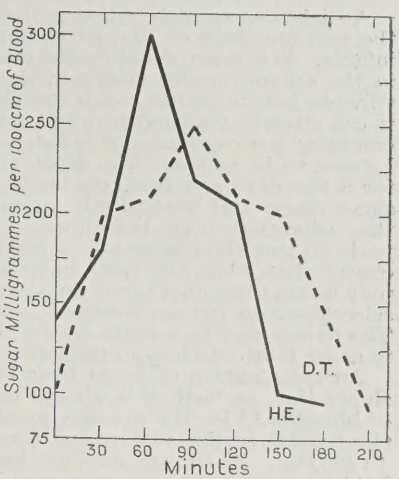
Having decided that these two cases were not cases of illness, I looked through my notes of cases and came to the conclusion that the condition is not so very rare, and that quite a number of patients are upon restricted diets when they might with impunity eat and drink whatever they liked. By no means, however, do I advocate departure from the rule: "treat every patient who passes dextrose in his urine as a case of diabetes mellitus until there is satisfactory evidence that the patient is not suffering from that disease."

CONCLUSION.

The following deviations from the standard, therefore, are not, as far as we know, illnesses, and yet have appeared to be: (1) pentosuria, lævulosuria, lactosuria, &c.; (2) low renal threshold for sugar; (3) temporary short hyperglycæmia following a meal; (4) low carbohydrate metabolism, probably congenital.

In the majority of diabetic patients metabolism permits a greater amount of fat in the food than carbohydrate. This is so common that many physicians have no time to study the exceptions; those that have time find that nearly 2 per cent. can utilise more carbohydrate than fat.

FIG. 5.



The study of so-called inborn errors in metabolism makes us realise that there are very many and varied deviations from the standard which can be recognised with comparative ease and are not diseases. I cannot help thinking that, although the metabolisms of all men bear a great similarity to one another, they differ in detail; I doubt whether our faces differ more than our metabolisms. One of the most convincing pieces of evidence that the metabolisms of different people are different exists in the fact that bloodhounds are able to track different people. If all the metabolisms of all men were identical the volatile substances elaborated would be identical, and dogs would be unable to distinguish people by their scent.

GRAVE FAMILIAL JAUNDICE OF THE NEWLY-BORN.

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UNDER this title, in 1920, an account was given by Sir Humphry Rolleston [1] of a condition occurring in successive infants of a family and usually proceeding to a fatal termination. The condition is rare, but during the last four years 18 cases, occurring in 17 families, have been under my care. Eight of these have been seen during the last nine months, and it appears probable, from the observations of colleagues, that the condition is more common than is generally recognised, advice not being sought because it is thought that nothing can be done. From the returns of the Registrar-General for England and Wales it appears that during the last seven years about 1800 infants have died of jaundice during the first four weeks of life, without obvious cause such as sepsis or obliteration of the bile-ducts.* I have

* It is probable that this figure errs in being too low, because deaths from such conditions as umbilical sepsis have been deducted from the figures for jaundiced infants, although only a proportion of these develop jaundice. In calculating the figure, an allowance has been made for cases of congenital obliteration of the bile-ducts, based on the known preponderance of males suffering from this condition. The figure given includes cases due to congenital syphilis but not certified as such; these

(*Continued at foot of next page.*)

recently seen three cases where treatment was commenced so late that the outlook appeared hopeless; of these two survived, but one died very shortly after treatment was commenced. My object in writing this paper is to draw attention to a form of treatment which has been successful in cases where it has been started sufficiently early. The condition shows considerable similarity to the physiological jaundice of the newly-born, and this is briefly reviewed for purposes of comparison.

Physiological Jaundice.

A slight degree of jaundice is often obvious within the first few days of life, particularly in premature infants. It is first noticed on the face and chest, then in the sclerotics, and finally in the hands and feet. Obvious jaundice is not seen before the second day, but it can often be rendered apparent earlier by carefully emptying the capillaries of blood, when the skin will be seen to be yellow. The depth of colour increases for a few days and then gradually fades, though in some cases, and particularly in premature infants, the coloration may last much longer. The first parts to lose the colour are usually the extremities, except that when the nails have been stained they may retain the colour for a considerable time, and the sclerotics also remain coloured for a longer period. The babies may be a little drowsy, but the condition is never fatal and has no pathological significance.

An examination of blood from the umbilical vein shows that at birth this always contains an excess of bilirubin.[2 3 4] The average quantity is 1 : 75,000, the normal in the adult being from 1 : 1,000,000 to 1 : 400,000. A similar amount has been found in babies born per vias naturales, and in those delivered by Cæsarean section. The condition is not, therefore, postnatal in origin, though the excessive production is continued during early postnatal life. Bilirubin can first be detected in measurable quantities in the blood at the fifth month of fœtal life and it increases in amount up to full term, the amount present in premature infants at birth being less, on an average, than in those born at full time. Attention has already been drawn to the fact that frank jaundice is much more likely to be present after birth in premature infants, and in them the postnatal rise of bilirubin in the blood is accentuated. After birth, in normal infants, the quantity of bilirubin in the blood rises, reaching a maximum on the third or fourth day, the amount in some cases being sufficient to cause definite staining of the skin. Thereafter, the bilirubin-content of the blood gradually falls, reaching the normal in about four weeks. In interpreting these results, stress must be laid on the presence of bilirubin in the blood before birth. It is not, therefore, in any way due to intranatal or postnatal changes of temperature, circulation, or nutrition. The amount of bilirubin in the blood of babies delivered by Cæsarean section or per vias naturales is approximately the same. It is fair to infer, therefore, that the degree of jaundice is not influenced by the actual parturition.

The sharp rise in the bilirubin-content of the blood after birth must be due to some factor associated with extra-uterine life, because it occurs both in premature and in full-time infants. That it is not due to feeding is shown by the fact that it begins before the infant is put to the breast, and the rise is approximately the same in infants fed on the breast and in those fed artificially. Two possible explanations suggest themselves, the first being that before birth only a fraction of the fœtal bilirubin is excreted by the liver, the remainder finding its way through the placenta into the maternal blood stream. After birth the liver may be some time in assuming its full function, and bilirubin would accumulate in the infant's blood. A similar delay in assumption of full function is found in other organs. The second possible explanation for the postnatal rise lies in the assumption of some maternal influence —hormonic, for example—restraining hæmolysis. After birth there is a fall in the hæmoglobin percentage, bearing an approximate relationship to the increase of bilirubin. Attempts have been made to explain the fall in hæmoglobin as being due to dilution. In rabbits the fall is accompanied by an increase in the amount of iron deposited in the liver, and there can be little doubt that in these animals active destruction of red cells is taking place. This is quite understandable; the percentage of hæmoglobin before birth is high, possibly in association with the active metabolism of the fœtus and the low percentage saturation of the fœtal blood with oxygen. Further, infants in which the jaundice is deepest usually show the greatest fall in hæmoglobin. Van den Bergh's test on the serum gives a positive indirect reaction only. These findings suggest that the jaundice is hæmolytic. Recently, the work of Murphy and Minot [5] has directed considerable attention to the liver as the source of an anti-hæmolytic agent, and it may well be that a hormone of this nature passes from the mother to the fœtus in utero, the sudden increase in hæmolysis after birth being due to the withdrawal of the maternal source of this substance. The passage of hormones across the placenta is one familiar enough in the case of other endocrine secretions as, for example, that of the thyroid. The blood of the infant, moreover, possesses certain points in common with that in pernicious anæmia, in which an extract from the liver is of undoubted value in overcoming the hæmolysis; this point will be more fully discussed in a later paper. Whether the delay in assumption be one of excretion, or in the production of an internal secretion, it seems probable that it is one in which the liver is largely concerned.

In view of the similarity of the processes occurring in prenatal and in early postnatal life, it appears probable that the difference is one of degree only, and is accounted for by separation from the mother. It seems unnecessary to attempt to account for the rise in the bilirubin after birth, as some have done, by reabsorption of bile from the alimentary tract (Knopfelmacher,[6] Thomson [7]), compression of bile-ducts by dilated liver veins (Weber [8]), cooling of the skin after birth (Lauret [9]), obstruction of the bile-ducts by mucus (Virchow [10]), or postnatal infection (Epstein [11]).

Grave Familial Jaundice.

This is a condition which occurs in successive infants of the same family. Sometimes one or two members of the family may escape and then it is usually the first-born which is normal. In one or two cases the second child has been slightly jaundiced and the colour has lasted rather longer than is the case with physiological jaundice. Occasionally a normal child may be found in a family in which both older and younger children have died of the disease. I have seen one case of twins, occurring in such a family, in which one twin was normal and the other jaundiced.

This condition has many points in common with physiological jaundice. The jaundice, however, usually shows itself on the first day, often within a few hours of birth; indeed, the infants may be born jaundiced. Thereafter it rapidly deepens until the skin becomes a deep bronze. Occasionally, however, the jaundice does not appear until the second day and the depth of colour attained, though considerable, may not be so intense. These cases may occur in

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(*Continued from previous page.*)

cases cannot be estimated from the returns. It also includes cases which may not be familial, but cases which I have seen in which jaundice has occurred within the first 24 hours after birth, and in which the jaundice was not due to the well-recognised causes, have without exception responded equally well to the treatment recommended in grave familial jaundice, though admittedly, when other members of the family have not died of the complaint, it is always possible that the infants might have recovered without treatment. The uniformly good results obtained, however, appear to justify the use of the statistics quoted above.

I should like to acknowledge the courtesy and great assistance extended to me by Dr. A. J. Thompson, of the Registrar-General's Office.

families in which the other infants have shown the typical degree of coloration, and do not appear to offer a better prognosis than the others. The infants are usually drowsy, take the breast poorly, and lose weight. The liver and spleen, as a rule, are not enlarged at birth, and often do not become enlarged during the course of the disease. In others, moderate enlargement of the liver and spleen may occur, particularly of the former. The enlargement, however, does not appear to be so great and the liver is not as hard as in cases of obstruction of the bile-duct. The stools are normal in colour, but the bowels tend to be costive. In all the cases I have seen the urine has been dark and has contained urobilin —and usually bilirubin—in excess of the amounts frequently found in the newly-born. Hæmorrhages do not form a conspicuous feature of the disease, though they may occur near its end, particularly in the subcutaneous tissues over the forehead, where they are not to be confused with the small spider-nævi which are common in all jaundiced babies and which rapidly disappear with the subsidence of the jaundice. In one case seen recently on the seventeenth day there was obvious melæna shortly before death.

The main features during the course of the disease are an increasing jaundice, increase in drowsiness, and loss of weight. Death usually occurs within three weeks, commonly within 14 days, and frequently with convulsions. In other cases, the end is extremely sudden. In some cases there have been attacks in which the infant has assumed a peculiar shade of greyness mixed with the icteric tint. In these attacks respiration becomes very shallow and slow and the heart-beat may be barely perceptible. They are presumably due to medullary failure and strychnine has been successful in my cases. In all the cases in the present series the parents have been in good health, the Wassermann reaction has been negative, and the pregnancies have been uneventful. In a number of cases the metabolism of the mother has been carefully studied before and during the pregnancies and no abnormality has been detected.

The condition is illustrated by the following case:—

The mother was married in 1908 at the age of 20. The first two children died in the first few weeks of life in convulsions. They were said to have been jaundiced, but the history is vague. The next child was born after six and a half months' gestation and was jaundiced; it only survived for three hours. The next child was jaundiced soon after birth, but recovered; this child is living. The next pregnancy resulted in a miscarriage at four months. Of the remaining seven pregnancies, all had come to full term; three had resulted in stillbirths, the children being born jaundiced. The remaining four were not obviously jaundiced when born, but jaundice developed a few hours after birth and rapidly deepened. The infants were very drowsy and died within periods ranging from three to eight days. The Wassermann reaction of parents and children was negative. On one occasion the van den Bergh reaction on the mother's blood immediately before labour was reported to be slightly positive, but this is usual in normal pregnancy; the mother was certainly not obviously jaundiced, and probably the finding has no significance as far as the present condition is concerned. At post-mortem no obvious cause for the jaundice could be ascertained.

Ætiology.

The disease closely resembles the physiological jaundice of the newly-born. A further delay in the assumption of hepatic efficiency would result in a greater degree of jaundice in the infant. Recent work on animals suggests that the products of the destruction of red cells may be extremely toxic. Intraperitoneal injections of small amounts of hæmolysed red cells in adult rabbits appear to produce little obvious effect; the injection of a proportionate amount in young, growing animals invariably inhibits growth. In the pregnant animal it leads to the death of the fœtuses in utero, usually with abortion; in two cases, in which the pregnancy was early, the fœtuses were retained in utero, with the formation of a mole. This finding will be more fully discussed in another paper; it is only mentioned here to show that the products of red cell destruction are toxic, particularly in young animals. The hæmolytic nature of the disease is supported by the fact that the infants become progressively anæmic. The accumulation of the toxic products of hæmolysis, inadequately excreted by the liver, would sufficiently account for the symptoms.

Diagnosis.

In the 18 cases discussed in this paper the parents have been apparently healthy and there has been no abnormality during the pregnancy. There are other cases, which I have not included under this disease, in which there is evidence of maternal toxæmia. In three published cases, those of Nason,[12] Tylecote,[13] and Rolleston,[14] the mothers had recurrent jaundice during the pregnancies, and during the last year I have encountered a case with a similar history. This patient also had albuminuria with œdema during her pregnancies, and on several occasions had fits. When I saw her she was not pregnant and the urine showed no abnormality. In two other cases (Smith,[15] and Ritchie[16]) the mother was jaundiced during one of the pregnancies. Jaundice in the infants is only a symptom, and it appears probable that there are many causes. Cases in which there is definite maternal toxæmia appear to belong to a different group from those which concern this paper, and deserve a separate name to differentiate them from other familial jaundices of the newly-born, which also have a grave prognosis. Even in these other cases, however, it appears to be quite as justifiable to regard the maternal toxæmia as fœtal in origin, as to regard the fœtal condition as due to the toxæmia of the mother.

Familial acholuric jaundice may give rise to mild jaundice in the early days of life but, as Chauffard[17] says, "the patients are more icteric than sick." I have notes of three families, however, in which all the children died during the first few weeks of life after a progressively increasing jaundice. An examination of the fragility of the red cells to hypotonic salines shows a markedly diminished resistance, and one of the parents is almost certain to exhibit a similar phenomenon. In each of the three cases mentioned, the red cells of the mother showed an increased fragility. In this condition the red cells are also smaller in diameter than the normal.

Congenital Obliteration of the Bile-ducts.—This condition, often occurring in several members of the same family, is usually associated with complete obliteration of the bile-duct, though the degree is variable. The liver shows evidence of biliary cirrhosis, supposed by Thomson[18] to be secondary to the biliary stasis. Rolleston[1] considers that the cirrhosis is due to maternal toxæmia, "followed by a descending obliterative cholangitis," while Wyard[19] thinks that the cholangitis is ascending from the duodenum, due to irritation set up by swallowed liquor amnii. In one of McGibbon's[20] cases of grave familial jaundice there was obstruction, though not obliteration, of the biliary papilla. In two of my own cases of grave familial jaundice there was in each family a history of one case being diagnosed post mortem as obliteration of the bile-ducts, but I have been unable to obtain further particulars. The two conditions are easily confused and the observation may be without significance. In grave familial jaundice both sexes appear to be equally affected; in obliteration of the bile-ducts, according to Thomson,[18] boys are affected more often than girls. Jaundice usually manifests itself about the second day and is progressive. On the other hand, it may not appear until the second or third week. The stools are white or only slightly pigmented and the urine is dark, owing to the presence of bile. Hæmorrhages often occur subcutaneously or from the mucous membranes. The child may appear quite fit until late in the disease. On the other hand, I have seen one case, verified at post-mortem, in which death occurred on the fourth day. In this condition the liver is usually considerably

enlarged and hard. The main points of distinction from grave familial jaundice are the colour of the stools and the size and hardness of the liver.

Congenital syphilis may rarely produce a pericholangitis with enlargement of the liver and spleen. Jaundice occurs early and is progressive, and the infants are usually extremely cachectic. The stools are pale and the urine is dark. Hæmorrhages occur, and though the liver is enlarged it is not usually so hard as in congenital obliteration of the bile-ducts. Other evidence of syphilis may be found in the infants or in the parents.

Infective jaundice is associated with other infective processes, either at the umbilicus or in the intestines. At the onset of jaundice the infant is usually obviously ill and the temperature is raised. It is wakeful and irritable and refuses its food. There is often cyanosis. The condition is, of course, not familial, though in cases of jaundice occurring for the first time in a family it is a condition which should be considered. The diagnosis is usually obvious.

Prognosis.

Of 130 cases collected by Rolleston, 100, or 77 per cent., proved fatal. In the families of my own cases, out of 90 untreated infants, 75, or 83 per cent., were fatal. In the combined series, 80 per cent. were fatal. With treatment, the prognosis appears to be good. Of 18 cases occurring in 17 families, 17 have recovered, and the eighteenth was seen so late in the course of the disease that it appears to be without significance, except to emphasise that treatment should be started early. Of the 17 which have recovered the eldest is now nearly four years of age, and all appear to be healthy children. This agrees with the impression of other writers on the subject, that when recovery occurs it is nearly always complete, though Morris [21] gives an account of a girl who lived for four and a half years, being jaundiced for practically the whole time.

Treatment.

If the suggestions given as to the ætiology of the disease be correct, treatment should be directed to the prevention of hæmolysis. In discussing physiological jaundice it was suggested that some substance was present in the mother's blood which was lacking in that of the infant, and in a former paper [4] on this subject an account was given of in vitro experiments on the effect of serum in inhibiting hæmolysis. These experiments confirmed the suggestion that the infant was short of an anti-hæmolytic agent, which could be given by injecting the mother's serum. It appeared, if grave familial jaundice differed only in degree from physiological jaundice, that if hæmolysis could be retarded for a time, the prognosis ought to be that of physiological jaundice, and therefore good.

The effects of treatment by serum are, perhaps, best illustrated by continuing the history of the case recorded above:—

The thirteenth pregnancy of this patient was uneventful. A male infant was born at full term. Jaundice developed within a few hours of birth. On the second day the infant was becoming very drowsy and very deeply jaundiced; the urine was dark and contained bile. On the third day the mother remarked that the child "was going just like the others." In view of the almost certain fatal termination and of the experimental findings referred to above, it appeared reasonable to give the child injections of serum, in the hope of supplying a missing factor. On the evening of the third day, 10 c.cm. of the mother's serum were injected intramuscularly. A similar dose was given on each of the two following days. Even after the second dose the child appeared to have improved. By the ninth day the bilirubin content of the blood had fallen to the level normally found in a child of this age. On the tenth day the jaundice was obviously fading; the child had a lusty cry, was not so drowsy, was feeding well, and had stopped losing weight. Following the advice given by Rolleston, artificial feeding had been used. Breast-feeding was now commenced, and from this time onwards improvement continued. The child is now nearly four years of age and recovery appears to have been complete.

The patient has recently had a fourteenth pregnancy; the infant again became fairly deeply jaundiced, but treatment was commenced earlier and the colour disappeared more rapidly.

In subsequent cases the infants have, as far as possible, been fed on the breast throughout.

In gauging the amount of serum required, the best guide appears to be the amount of bilirubin in the blood of the child. Serum has been given intramuscularly into the buttock, in daily doses of 5–15 c.cm., according to the condition of the child. The injections have been continued until the bilirubin content of the plasma has fallen to approximately 1:150,000. The amount required has varied from 30 to 60 c.cm. The serum is very rapidly absorbed, and no ill-effects have been observed. Serum, and not whole blood, should be used for two reasons: (1) red cells are not rapidly absorbed and the injections would give rise to hæmatomata, with their attendant risks of sepsis, which would almost certainly be fatal; and (2) absorption of hæmolytic products would almost certainly aggravate the condition.

Summary.

In the condition described as grave familial jaundice, the yellow colour usually appears on the first day; the temperature is normal; the stools are normal in colour; the urine contains excess of urobilin and frequently bilirubin; the liver and spleen are not usually enlarged. In untreated cases the condition is progressive and the prognosis is bad; on the other hand, in 17 out of 18 cases treated with serum the infants have recovered; in the eighteenth case treatment was only commenced on the seventeenth day, a few hours before death, when the child already appeared moribund. The case cannot be regarded as one in which the treatment has failed, but serves to emphasise the gravity of the condition and the necessity for early treatment.

In conclusion, I should like to stress two points: (1) Jaundice occurring within the first 24 hours after birth should always be regarded as serious. (2) In cases in which there is a familial history of infants dying of jaundice, even if the jaundice does not appear until the second day, it should be regarded with equal gravity.

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ENLARGEMENT OF CUMBERLAND INFIRMARY.—A new out-patients' department of this Carlisle hospital, which has cost over £33,000, has recently been opened. It forms the first part of a series of extensions which include two new wards, enlargement of the nurses' home, the reorganisation of the administration block, and the provision of a pathological department.

AN INVESTIGATION INTO THE CAUSE OF ARTHRITIC MUSCULAR ATROPHY.

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In a previous communication[1] an account was given of some experiments which had been undertaken with a view to investigating the muscle-wasting that accompanies arthritis. A review was given of the bibliography[2] and the various theories that have been advanced. Experiments were planned which should throw some light on the metabolic activity of the muscles, and it was found that there were marked differences in this respect between muscles which had wasted as a sequel to arthritis and those in which the atrophy resulted from disuse. In the former there is a great increase in the oxygen consumption, the average oxygen used by atrophied muscle being as much as 8·3 c.mm. per 1·0 g. muscle for one minute, as against 4·6 c.mm. for the normal. In the muscles which were wasted from disuse (immobilised in plaster-of-Paris) the oxygen use was only 5·1 c.mm. per g. per minute. It was suggested that the increase is the result of an increased katabolism, the atrophy resulting from failure of the reparative powers to keep pace with this undue tissue breakdown. In pure disuse atrophy the almost unaltered oxygen consumption probably means that there is no increased katabolism, but simply an impairment of the synthetic powers on the affected side. The suggestion was put forward that arthritic wasting might be due to an increased number of impulses (or abnormal impulses) arising in the joint, making the spinal centres abnormally excitable—i.e., that there is a reflex basis for the wasting. In pure disuse, on the other hand, where is a reduction of afferent stimuli, for when a joint is immobilised proprioceptive impulses, which depend on movement for their initiation, will be in abeyance. The wasting under these circumstances results from partial suppression of reflex excitation; the spinal centre has in no way been interfered with, and re-establishment of activity finds it able to resume its functions in the regular way.

Method of Experiment.

To put the question to the test, it was decided to cut the posterior nerve roots carrying the afferent nerves from the knee extensors of the left hind-leg and to allow of complete degeneration before setting up an arthritis. The right side was left intact to serve as a control. The animals used were rabbits and cats. Great difficulties were experienced in setting up an arthritis in both series, and the methods employed in the case of rabbits have been fully described in a previous paper.[2] Wasting was constant in every case of arthritis, but the degree varied considerably, and was not related to the duration of the arthritis. The cats were given a preliminary injection of isopral and sedonal, 1·15 c.cm. per kg. as recommended by Lambert,[3] and subsequently anæsthetised with open ether. Laminectomy was done, and the lower three lumbar and upper two sacral posterior nerve roots were cut on the left side. All the animals were very ataxic for the first 10–14 days, then gradually learnt to control their deafferented limbs. After one month injections were made into both knee-joints. The following organisms, obtained from the Lister Institute, were used for this purpose: *Streptococcus frequens*, *S. salivarius*, and *Diplococcus rheumaticus*, also a strain of the scarlet fever streptococcus, obtained from the Wellcome Research Laboratories. No constancy of reaction was found. Sometimes arthritis followed the injection, sometimes there was no result. Repeated injections of the same organism, as used by Kniest Faber,[4] and of different organisms were then tried, but with similar periodic success.

An attempt was therefore made to set up a preliminary irritation by injecting cantharidine 1/200 in acetic ether, iodoform, or eucalyptus 1/14 in iodoform, and giving subsequent injections of organisms. Again arthritis sometimes followed, but in other animals there was no reaction. The following series consists only of the animals which showed clinical enlargements of their joints. There was no structural fixation of the joints, and all the animals used their arthritic limbs freely, and appeared to suffer very little pain.

Results.

Three sets of controls were made: (*a*) section of posterior roots only, to show that no atrophy results from deafferentation; (*b*) arthritis set up in left joint only, to show ratio of wasting to body-weight; (*c*) bilateral arthritis set up, with no preliminary nerve section, showing that an approximately equal wasting can be produced. The animals were kept alive 8–10 weeks, and their weight was taken at the beginning and end of the experiment.

TABLE I.—*Controls.*

(A) *Section of left posterior roots, showing absence of wasting due to section.*

Cat.	Total weight of animal in g.	R.Q.	L.Q.	Expressed as percentage of body-weight.	
				R.Q.	L.Q.
I 1	2150→2250	30·09	30·50	1·33	1·35
I 2	2200→2200	30·39	30·20	1·38	1·37
I 3	2500→2080	25·58	26·50	1·23	1·22
I 4	2700→2700	33·81	33·59	1·25	1·24
I 5	2670→2370	31·61	32·00	1·33	1·34
B 2	—	34·39	34·00	—	—
K	—	31·4	30·9	—	—

(B) *Organisms or chemicals into left joint only, showing degree of wasting.*

D	2200→1825	25·98	19·91	1·42	1·09
G	2670→1950	21·49	18·01	1·10	0·92
Z 2	2700→2400	30·85	20·12	1·28	0·83

(C) *Organisms or chemicals into both joints—i.e., showing equal wasting.*

B 1	1950→1950	14·29	16·50	0·76	0·84
Z 4	1737→1750	15·96	16·90	0·91	0·97
M	3000→3000	34·8	34·5	1·16	1·15
I 6	2876→2800	26·9	26·2	0·96	0·93

R.Q. = Right quadriceps. L.Q. = Left quadriceps.

Table I. (A) shows that in cats the average weight of the quadriceps extensor femoris is between 1·22 and 1·38 per cent. of the total body-weight. In (B) the degree of wasting is such that this percentage is reduced to 1·09–0·83 per cent., and this is again shown in (C) where even lower figures were obtained —0·76 and 0·84 per cent. The wasting on each side was very similar.

TABLE II.—*Experiments.*

Section of left roots, organisms, or chemicals into both joints—showing reduction of wasting on deafferented side.

Cat.	Weight of animal at beginning and at end of expt.	R.Q.	L.Q.	Expressed as percentage of body-weight.	
				R.Q.	L.Q.
H	2750→2650	26·60	35·63	1·00	1·34
E	2200→2000	15·01	22·90	·75	1·14
F	3000→2850	27·70	33·68	·97	1·18
J 1	2000→2000	20·10	27·15	1·00	1·35
L	2570→2570	24·59	33·51	·95	1·30
J 5	2573→2950	34·52	38·95	1·17	1·32
J 3		28·5	35·5		
J 4	2750→3323	37·5	35·8	1·12	1·07
I 7	2400→2044	23·1	21·7	1·13	1·06

Nine experiments were then made on laminectomised animals, and it is clear that the result of deafferenting a limb is to prevent the wasting almost entirely. (Table II.)

The right quadriceps, the nerve-supply of which was intact, showed the usual degree of wasting. The left quadriceps in four of the experiments was 1·3 per cent. of the body-weight—i.e., within normal limits—in two 1·14 and 1·18 per cent. The two low values may be due to the fact that the animals were in very poor condition and had had severe degrees of arthritis. Experiments J 4 and I 7 do not fit in with the series at all, and no adequate explanation of them has been found. In both a bilateral arthritis was established of approximately equal intensity, but despite the fact that the left legs were deafferented the wasting was more marked in the left quadriceps than in the right. The animals were in good condition and the arthritis of average degree.

These results show that the wasting is due to some reflex cause, but before investigating this point further it seemed advisable to find out whether a similar basis could be demonstrated in disuse atrophy. Laminectomy was again done on cats, and after 4–6 weeks, when the skin was soundly healed and the animals fairly steady on their legs, the left leg was immobilised in plaster-of-Paris. The leg was completely flexed at the hip, the knee being extended and the bandage, after several turns round the leg below the knee, was then taken round the body, the whole leg being then included in the subsequent bandaging. The leg was thus carried parallel with the body as if in a sling. The animals soon learnt to walk on three legs and, as the foot and leg were well padded with cotton-wool, no swelling took place. After immobilisation for 6–8 weeks the animals were killed and the knee extensors dissected and weighed. The following figures show clearly that no reduction of the wasting is effected by deafferentation.

TABLE III.

Cat.	Total body-weight at beginning and end of expt.	R.Q.	L.Q.	Expressed as percentage of body-weight.	
				R.Q.	L.Q.
1	→3165	43·0	31·8	1·35	1·00
2	2600→2534	37·8	25·8	1·49	1·01
3	2650→2736	37·2	28·3	1·34	1·03
4	3580→3189	39·2	30·0	1·22	0·94
5	→2600	35·0	25·4	1·34	0·97

Clearly, then, no reflex cause can be invoked in explanation of disuse atrophy. This was not altogether unexpected, in view of the metabolic differences already referred to.

Discussion.

It is suggested that the sequence of events is as follows. The presence of the arthritis provides an abnormal stimulus to the afferent nerve endings, as a result of which the corresponding spinal centre becomes unduly excitable. This causes an abnormal discharge of impulses to the muscles, and results in a condition of heightened activity, which is evidenced by the raised oxygen consumption. This state of affairs might last long after the original cause had subsided, and would account for those cases quoted by Charcot,[5] in which muscular wasting was present for as long as one year after the initial injury.

Lippmann and Selig,[6] working on rabbits, found that the atrophy following arthritis closely resembles that following nerve section and tenotomy. They point out that "the muscle atrophies that follow tenotomy and nerve section are due to cessation of muscle function; are therefore true disuse atrophies. The atrophy that follows experimental arthritis is preceded by muscle relaxation—muscle collapse—and the subsequent course is the same as that which obtains following tenotomy and nerve section. It is therefore reasonable to conclude that arthritic atrophy is also a disuse atrophy. The muscle disuse, however, is not caused by voluntary immobilisation or external fixation but is due to muscle collapse. Hence the theoretical and experimental evidence leads to the inference that although arthrogenic atrophy must be considered a disuse atrophy, it is not due to immobilisation, but is caused by a reflex mechanism." That there is some reflex mechanism underlying the atrophy is proved by my experiments, but the suggestion that this is reflex muscle collapse is not tenable in view of the fact that the knee-jerk was present and active in all my animals with an intact reflex arc, and the arthritic limbs were as freely used as the sound. Furthermore, these same observers found practically no atrophy as the result of immobilisation. They conclude that "the atrophy obtained by others with experimental immobilisation was caused not by the fixation itself; it was no doubt due to extraneous factors, injury, excoriation," &c. I would like to emphasise that in no single animal of mine which had been in plaster-of-Paris was there any injury, excoriation, swelling, or other evidence of impaired blood-supply. It is therefore hard to understand or to accept the above findings.

I think my experiments raise more questions than they answer, but one thing is clear: two forms of muscular atrophy have been differentiated, one reflex and one due to disuse, and for the latter there is no reflex basis. The nature of the reflex mechanism underlying the former is still unsolved.

I have to express my sincerest appreciation to Prof. C. C. Choyce for his unfailing interest and assistance in the work, which has been done under his direction. I have also received constant help from H. E. Roberts, who has given me many suggestions as to the making up of the solutions employed, and other technical points.

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THE VERNES METHOD OF ESTIMATION OF FLOCCULATION IN SYPHILITIC SERA.

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NEARLY twenty years ago I published a note in THE LANCET on the then new "serum diagnosis of syphilis,"[1] and in the two subsequent years further notes[2 3] on the value of the Wassermann reaction for the control of treatment. In a small volume published in 1912, I emphasised the non-specificity of the reaction, and pointed out that the value of the test, though great, was relative and not absolute, and that positive reactions occurred apart from syphilis.[4] Six years later[5] I uttered a warning that the value of the Wassermann reaction, both for diagnosis and control of treatment, was limited, and that what was necessary to ensure uniformity of result was a standardisation of reagents so that the variants and the personal factor were reduced to a minimum.

The Vernes test eliminates variants and reduces the personal factor, and therefore (always providing that the Vernes photometer is an instrument capable of accurate measurement of small differences in opti density) must theoretically be acknowledged as a possible advance on the Wassermann test. The further evidence in regard to the Wassermann reaction that has accumulated during the last ten years has not altered my opinion. During this decade I have occasionally recorded further instances of contradictory Wassermann reactions at short intervals of time and without intervening treatment, and positiv

Wassermanns in cases where no confirmatory evidence, either historical or clinical, could be obtained.[6]

During the last 20 years I have reiterated my opinion that while the Wassermann reaction was a good servant it was a bad master, that the test was clearly not specific, that there appeared no logical reasons why other similar chronic infections should not produce a like reaction, and that, therefore, no one should be dogmatically branded as a syphilitic on the evidence of a positive Wassermann reaction unsupported by any other historical, clinical, or pathological evidence.

Records at St. John's Hospital.

By the courtesy of Dr. E. Ofenheim I have recently been given the opportunity of comparing the results of tests applied to the sera of syphilitics by Wassermann's method and by the syphilometric method of Vernes which Dr. Ofenheim has carried out in his laboratories at St. John's Hospital, Lewisham, for the last three years.

I examined 863 reports. The Wassermann reports were: negative, 464; positive, 368; doubtful, 31. Of these 863 tests, 635 (74 per cent.) showed complete agreement between the two methods; that is, the positive Wassermanns showed Vernes figures of "7" or over, the negative Wassermanns showed Vernes figures below "3," and the doubtful Wassermanns showed Vernes figures between "3" and "7." The remaining 26 per cent. of cases were composed as follows:—

W.R.	negative	and	Vernes	doubtful	9 per cent.
„	positive	„	„	negative	7 „
„	„	„	„	doubtful	5 „
„	negative	„	„	positive	2 „
„	doubtful	„	„	negative	2 „
„	„	„	„	positive	1 „

Most of the "Wassermann positive, Vernes negative" results were cases which had received treatment and in which there was no clinical evidence of infection when these tests were taken, and the charts seemed to show that the Vernes test registers reaction to treatment much more delicately than the Wassermann, but that a Vernes negative during treatment can only be taken as showing that the treatment is producing a definite effect, and is no indication whatever that cure has been effected. If, however, treatment has not been received recently the Vernes negative appears to be of greater diagnostic value than the Wassermann negative. If the "under treatment Vernes negative Wassermann positive" cases and the "doubtful" in both tests are eliminated, the cases of definite divergence in diagnosis by these tests are reduced to 4 per cent. in one-half of which the Wassermann is positive and Vernes negative, and in the other half the Wassermann is negative and the Vernes positive. In these cases clinical evidence seems to support both tests about equally.

Simplicity and Uniformity of the Vernes Technique.

When once the optical apparatus has been accurately adjusted—a matter requiring patience and experience—the reading of the illuminated scale of optic density of the various sera on Vernes photometer is so simple that the personal element is almost eliminated; much to my surprise, my very first readings coincided almost exactly with those obtained in Dr. Ofenheim's experienced hands. It is essential to maintain the room and water-bath temperatures constant at the prescribed degree, and to mix and measure the reagents efficiently and accurately, so that a comparatively small and undisturbed room is necessary, and the test can only be satisfactorily carried out in a well-equipped laboratory.

The Wassermann "home-made" reagents must necessarily vary with the different laboratories, and from time to time in the same laboratory, as a really accurate titration of these reagents is often impossible and generally impracticable. In the Vernes test all the variant Wassermann reagents (locally prepared alcoholic heart extract, complement, and hæmolytic system) are dispensed with, the only reagents used consisting of Vernes's centrally prepared horse heart extract, absolute alcohol, and doubly distilled water. In the Vernes method, therefore, there is absolute uniformity of reagents, whether the test is carried out at the Vernes prophylactic institute, Paris, or in other laboratories in France,[7 9], England,[12 13] America,[8] Italy,[11] Argentine,[14] Denmark,[10 15] Switzerland, or Germany, where a large number of tests have now been recorded. Not only are the reagents constant, but the temperature, the rate of mixing reagents, and the mechano-optical method of recording the degree of optic density are constant. The result is read on a scale which permits little personal error. The amount of flocculation or optic density is not estimated by the human vision, nor is it recorded in agreement with a self-appointed scale by the human brain. The difference between the methods of arriving at a degree of flocculative optic density with the Vernes photometer and with naked-eye estimation is somewhat analogous to naval range-finding with a modern instrument, as compared with the old-time human judgment based on vision. Neither the Wassermann nor the Vernes test can be claimed as pathognomonic, as in both tests a heart extract is used which is not a true syphilitic antigen. In the Vernes test, however, this alcoholic extract of horses' heart is constant, as it is accurately prepared in bulk in Vernes's laboratories, and distributed in small phials to all laboratories undertaking the Vernes test.

All the laboratories that have investigated Vernes's method appeared to agree that the Wassermann reaction and the Vernes test accord in the great majority of cases. The point which has not yet been finally and definitely established is which of these tests is the more reliable where they differ. The large amount of evidence that is accumulating seems, however, to suggest that the Vernes test may ultimately prove the more reliable, and that the occasions when the Vernes tests contradict themselves, or are at variance with clinical history, may be less frequent than with the Wassermann reaction. The final verdict on the comparative value of the Wassermann and the Vernes tests lies in the future, and will only be arrived at after an immense number of reactions to both tests have been recorded in the laboratories of the world. There seems little doubt, however, that the Vernes test merits serious consideration, and it seems a matter for regret that St. John's Hospital, Lewisham is, as far as I know, the only laboratory in England (with the quite recent exception of St. Mary's Hospital, Paddington) where this test is being investigated.

It is claimed that the Vernes method is not only applicable for serum but is also of value with the cerebro-spinal fluid, on which it can be used in two ways, for the estimation either of what we may call the Wassermann substance or of the albumin content.

In this note I do not propose to discuss either the theory or the technique of the Vernes test, which are recorded elsewhere,[7 8 12] but I wish, as a student of the serum reaction of syphilis for 20 years who has always tried to maintain a strictly unbiased view, to draw attention to the data in regard to the Vernes test, and to stimulate further research on it in Great Britain. The clinician alone can decide which of the tests has the greater value, either for diagnosis or the control of treatment, and he can only decide after prolonged and comparative experience of both tests in relation to the clinical progress of the case. So far, the clinician has been afforded little opportunity in this country of forming his own opinion. The charts I have examined at St. John's Hospital, Lewisham, and those published in the literature, seem to suggest that those cases which exhibit contradictory or doubtful Wassermanns show less contradiction or doubt with the Vernes test. The published records of the Vernes test also seem to show that different individuals react very differently to arsenobenzol, mercury, and bismuth, and that a fall in the Vernes optic density figure may occur more readily in one patient with arsenobenzol, in

another with mercury, and in a third with bismuth; also that the downward curve of the Vernes optic density chart may often be hastened by a change of treatment. They appear also to confirm clinical opinion that arsenobenzol is perhaps the least potent drug for the treatment of central nervous syphilis. Curiously enough, some of the Vernes test results suggest that the mercury pill, the stand-by of our fathers, is of quite considerable value in some cases and hardly deserves the contempt that has recently been its lot. Vernes's test also seems to indicate that there is at least temporary involvement of the cerebro-spinal fluid during the secondary period of infection, and that a normal Vernes optic density figure of the blood serum may be present with a high optic density figure of the cerebro-spinal fluid. I have not been able to find any record of clinical or pathological relapse in syphilitic cases where the Vernes optic density figure of both blood and cerebro-spinal fluid has returned to and remained at normal for eight months. If, as Vernes claims, there is reasonable hope that, after such a short period of normality, it is safe to declare a person definitely cured, a very great achievement would be recorded, and one that would relieve both clinician and patient from much anxiety. The Vernes optic density figure also seems to fall and rise more closely and definitely in relation to clinical improvement and relapse than does the Wassermann reaction.

In the Wassermann reaction the quantitative estimation from the strongest positive to the complete negative is necessarily limited as, even when three strengths of serum are used (2½ per cent., 5 per cent., and 10 per cent.) the scale is a short one, since complete inhibition of hæmolysis, partial inhibition, and complete hæmolysis are the only degrees that can be recorded with each dilution. With the Vernes test, on the other hand, the scale runs from zero up to or beyond 280 degrees, although over "7" is taken as a definite positive, so that the degrees of positiveness or of Vernes's optic density figure above "7" cover a very long scale in which small alterations in "positiveness" are clearly and definitely shown. The doubtful zone is a very narrow one in the Vernes test, lying only between "3" and "7," as less than three degrees of Vernes's optic density figure is definitely normal. Sera that show Vernes's degrees between "3" and "7" must be returned as doubtful, and should be re-examined on several occasions. Over five degrees is probably positive. It must be understood that the Vernes degrees are relative, not absolute, and are arrived at by subtracting the optic density scale reading of the incubated serum-alcohol-distilled-water mixture from that of the serum-horse-extract-distilled-water reading. For instance, if the reading in one were 134, and the other 136, the difference or Vernes's figure would be "2," and the serum not syphilitic; while if the reading of the one were 172, and the other 197, the difference would be "25," and the serum syphilitic; and if the reading of one were 183, and the other 187, the difference would be "4," and the serum reported as doubtful.

Even if the Vernes test is no more accurate than the Wassermann for diagnostic purposes, its far greater range of degrees of positiveness offers a marked advantage as a method of controlling treatment and estimating the therapeutic value of the drug to the individual. It is not uncommon to record a Vernes degree of positiveness of well over "100" in untreated cases of syphilis, and this degree may fluctuate between such a high figure and "7" according to the treatment and the individual's reaction to the treatment. The Vernes chart may record these great variations in positiveness, while the Wassermann reaction remains unchanged at "strongly positive ++."

If there is a greater fall in the Vernes degree after a bismuth than after an arsenobenzol course (or vice versa) it is highly probable that the drug producing the greater fall is the more potent for that patient at that time.

The opsonic index has departed to the limbo of discredited tests because different indices were so frequently obtained with the same serum by different observers. It is not unknown for one laboratory's doubtful Wassermann to be the negative of another, and perhaps even the positive of a third, while the encouraging factor about the Vernes test is that the Vernes optic density figure of the same serum, as reported by different observers, usually lies within an extremely narrow zone. Whatever the ultimate verdict may be, Dr. Ofenheim and St. John's Hospital, Lewisham, can be congratulated on their pioneer work in this country in investigating the Vernes test.

Conclusions.

The widespread opinion of responsible observers with an extensive experience of the Vernes test appears to agree that: (1) the Vernes method is an improvement on all flocculation tests where the optic density is measured by the unaided eye; (2) the Vernes method of diagnosis agrees with the Wassermann reaction in the great majority of cases; (3) the Vernes method is superior to the Wassermann reaction for the control of treatment; (4) the Vernes photometer affords a rapid and convenient method of estimating the albumin content of the cerebro-spinal fluid.

With such a consensus of opinion in Europe and America the neglect of the majority of the medical laboratories of this country to explore an apparatus and technique that claims to afford the observer an accurate estimation of flocculation is remarkable. No doubt the cost of the photometer, mixer, water baths, and other apparatus which, with import duty, exceeds £100, is one reason why the test is so little known in Great Britain, where most laboratories do not possess any research fund. This test has received very little publicity in English medical literature, and consequently there are many, even in the front ranks of our profession, who have never heard of the test, although a fairly bulky foreign literature on the subject is accumulating. The superiority of the Vernes test over the Wassermann test has not yet been proved here, but neither has it been disproved. The Vernes method certainly deserves a wider investigation in this country than it has hitherto received.

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WORK OF EYE HOSPITALS.—The annual report of the Wolverhampton and Midland Counties Eye Hospital shows that last year there were 12,920 new patients, of whom 769 were in-patients, and that 6880 accidents were treated. In the ultra-violet ray department there were 4221 treatments, nearly double the previous year's number. The Bradford Eye and Ear Hospital is to be enlarged, and the operating theatre, intended for three operations a day, whereas now the average exceeds ten, modernised. Last year there were 3280 operations and nearly 37,000 out-patients' attendances.—Extensions of the Sussex Eye Hospital have been approved which will provide accommodation for 50 patients. The out-patient department is to be enlarged and appliances modernised, and it is hoped to provide beds for paying patients. The work will cost £25,000.

IODISED TINCTURE OF GUAIACOL

IN THE TREATMENT OF SYNOVIAL AND SEROUS AFFECTIONS.

By JOHN MABERLY, M.R.C.S. Eng.

THE preparation tinctura iodo-guaiacol contains in solution an iodine addition-compound of guaiacol, C_6H_4 OH.OCH_3—the methyl ether of pyrocatechol. Efforts to produce it in a dry state fail because secondary changes occur during the attempt: therefore no empirical formula can be assigned to it. One fluid drachm of the tincture contains one-fortieth of a grain of iodine in organic combination. In vitro iodine is one of the most powerful germicidal or antiseptic agents we possess. In vivo, however, none of the saturated inorganic pharmacopœial preparations exhibit any marked internal antiseptic action. From a chemical point of view potassium iodide seems peculiarly fitted to act as a carrier of iodine to the system. The atomic weight of its two elements—potassium 39 and iodine 127—means that in administering eight grains of potassium iodide we are apparently giving rather more than six grains of iodine, equivalent to half an ounce of the tincture. It is quite evident that its capacity to set free iodine in the system in a form in which its antiseptic properties are active, potassium iodide must be virtually inert. It was with the idea of obtaining some unsaturated organic form of iodine which could be taken by the mouth and would exhibit some of antiseptic properties of iodine in the system that the tinctura iodo-guaiacol compound was constructed.

The object especially in view was the treatment of pulmonary tuberculosis. The fact that guaiacol apparently had some beneficial action as an internal antiseptic in that disease suggested that its combination with iodine might give more definite results. Administration of the compound in several advanced cases of pulmonary tuberculosis over periods varying from one to eight weeks made it clear that, although the drug was non-toxic, it had no definite antiseptic action, at any rate in the finer lung tissue. Its use in place of potassium iodide in the class of cases in which I had been accustomed to use the latter drug, such as gummata and late neuro-syphilitic affections, proved that it was more efficient. In children with a tendency to enlargement of the tonsils and adenoids, which we now look upon as being probably dependent on a deficiency in thyroid extract, the tinctura iodo-guaiacol also appeared beneficial. Some interesting results in South Africa suggested that the drug had antiseptic action in the serous fluids and membranes, and experimental administration in pleurisy and synovitis confirmed this idea.

Cases of Pleurisy.

The following case of acute pleurisy is a good illustration of this action:—

The patient, a well-built man of 24, was seen on Sept. 24th. He had been suffering for two days from an acute feverish attack with a series of rigors, dry cough, and very severe pain in the right chest on breathing and coughing. He gave history of exposure to rain and cold. His temperature was 102·6° F.; breathing rapid and shallow. The breath sounds were obscured over the front of the right chest and the percussion note was dull from the fifth interspace downwards over a limited area, with some friction sounds just below the nipple line. Tinctura iodo-guaiacol, one fluid drachm to half an ounce of syrup and water, was ordered to be taken every eight hours.

Sept. 25th: The patient was distinctly easier, and stated that the rigors had ceased and the pain was very much less. His temperature was 100°.

26th: The temperature was 98·6°; the pain had gone. The breath sounds were still somewhat obscured but were audible over the dull area.

28th: The temperature was 98·2°. All signs of pleurisy had disappeared. The patient was allowed up the next day and no further medical attendance was required.

In my lung ward at the military hospital at Roberts Heights in 1917 and 1918 five cases of dry pleurisy came under treatment among malarial patients from East Africa. The symptoms in each case were typical, with dull patches, obscured breath sounds, friction, and pain on breathing. The temperatures were variable on account of the presence of malaria. All these cases cleared up rapidly on administration of one drachm doses of tinctura iodo-guaiacol, given three times a day for the first 24 hours and then twice a day. Relief from pain was obtained within 24 hours and the physical signs disappeared in three or four days. During the last two years similar rapid relief from pain and symptoms has been obtained in patches of pleurisy among sanatorium patients suffering from pulmonary tuberculosis in England. In pulmonary tuberculosis especially one meets with cases in which there are old, permanently adherent patches of pleura which are subject to acute attacks occasionally. In these, although the pain and signs of active microbic infection quickly disappear, the dull patch of adhesion remains.

Whilst I was on military service more than one case of pleurodynia was sent into my wards diagnosed as pleurisy. This rheumatic form of nerve muscular affection does not come under the action of the tinctura iodo-guaiacol, but the preparation has proved curative in uncomplicated cases of acute pleurisy with effusion and also in the dry type. Cases which come under treatment after a definite amount of effusion has taken place naturally take longer to clear completely than do those in which the treatment is undertaken at an earlier stage. The resolvent action of the drug may, I think, be relied upon to create absorption in most cases without surgical interference. Where evacuation of the effusion seems necessary, aspiration or evacuation by simple incision, with immediate closing of the wound, is all that is necessary; the antiseptic and resolvent action of the drug should then be effective in completing the cure. If the pleura is left open and drained of its fluid, the drug fails to act so satisfactorily.

In many cases, especially in England, acute pleurisy is complicated with an unhealthy condition of the adjacent lung tissue, usually of a septic or pneumonic type. In these cases the results of administration of the tinctura iodo-guaiacol are not so satisfactory or definite as in the uncomplicated cases. The drug has no disinfectant action in the finer lung tissue and, although the pleura will improve, the lung condition with cough and temperature may continue. In two cases of pneumothorax, one tuberculous and the other non-tuberculous, the results were very satisfactory. Healing and resolution took place in a very short time.

In the treatment of synovitis and teno-synovitis of septic and tuberculous types similar antiseptic and antiphlogistic action has been evident.

Tuberculous Synovitis of the Dorsal Vertebræ.

This patient, a married woman of 28 with one child, had been suffering for two years from intermittent attacks of pain about the region of the third and fourth dorsal vertebræ. It had gradually been getting worse and threatened to incapacitate her. She had been in Cape Town hospital for three months and the diagnosis had been confirmed by the tuberculin test. When she returned home the symptoms recurred as soon as she attempted to get about and do any work, such as using a broom or her sewing machine. There was marked pain on palpation and percussion over the spines of the third and fourth dorsal vertebræ. I prescribed tinctura iodo-guaiacol, one fluid drachm in half an ounce of syrup and water, to be taken twice a day. The pain steadily diminished and at the end of a fortnight both the pain and tenderness on pressure had entirely disappeared. She continued taking the drug once a day for another fortnight. During the next two months she gained a stone in weight and was quite free from symptoms. She stated that the first three doses produced an almost immediate reaction, a peculiar sensation at the painful part and a general reaction "similar to the effect of a stiff tot of brandy." It lasted about ten minutes and did not recur after the third dose.

Septic Inflammation of the Knee-joint.

The patient, a boy of 8, had fallen in the road and suffered from a contused open wound over the left knee-joint. This was disinfected and the wound sutured. The wound

remained healthy but three days later the synovial membrane was painful and swollen. Tinctura iodo-guaiacol, one fluid drachm every 12 hours, was ordered. The pain and swelling disappeared during the next three days and the child was allowed to get up four days later and had no further trouble.

Other cases of tuberculous and septic types of synovitis have at various times come under treatment, and in each case the same antiseptic and healing action has been obtained. The drug was tested in advanced tuberculous disease of the spine and hip-joint in which suppuration and disease of the cartilages or bones was present. In these cases it completely failed to have any definite effect. Its therapeutic action has proved to be confined to the synovial membranes only; when once the disease has extended to the other tissues, it has no longer any curative action. The same want of any definite disinfectant action is found if a synovial membrane such as that of the knee is opened and kept drained of its fluid, as in the case of the pleura. The antiseptic action, both in the pleura and synovial membranes, apparently depends on the presence of the serous or synovial fluids and the integrity of the membranes. It is not evident in the blood or other tissues of the body with the exception of the ciliary membranes. In traumatic inflammation of the joints, and in sprains about the joints and tendons, the tincture has a rapid antiphlogistic action. The pain and inflammation disappear after administration of the drug, though the effusion may persist for a variable time.

Conclusions.

The uniform results obtained in a fairly large number of cases of pleurisy and synovitis of various types justifies the conclusion that in tinctura iodo-guaiacol we have a drug which has a definite selective antiseptic and antiphlogistic action in these membranes, provided they are closed, and one which fills an important gap in our materia medica for the treatment of septic, tuberculous, and traumatic inflammation of those membranes. It also exhibits the well-recognised resolvent effect of iodine.

The therapeutic effects of the tincture in the pleura and synovial membranes suggests that a similar action would be present in the other serous membranes and spaces, such as the cerebro-spinal and peritoneal. A limited experience of the use of the drug in meningitis, and in syphilitic and other infections of the cerebro-spinal system, supports this contention and further work on these lines appears very desirable. In the cases in which I have used the drug with apparent success lumbar puncture was not performed. In three cases of severe meningitis treated by another observer, lumbar puncture and the instillation of medicated serum was performed before and during the administration of the tincture. The results were completely negative. In any future work on these lines I would suggest that lumbar puncture should be avoided. It seems most likely in the case of a drug which only acts in a certain environment that any interference with that environment would nullify its action.

Dosage.

One fluid drachm given twice a day is sufficient in ordinary adult cases. In acute or dangerous conditions two or more drachms have been given every four hours for two or three doses. After that the smaller dose given once or twice a day has been found sufficient. Children are tolerant of the drug and take half to one drachm given in a similar manner. The addition of a little simple syrup to each drachm of the tincture, and water to half a fluid ounce is not an unpleasant mode of administration. Chloroform either alone or in solution is quite incompatible.

It is very difficult in general practice, without the facilities of a hospital and skilled laboratory help, to carry out to a satisfactory conclusion any therapeutic investigation, especially if the results are unexpected. One has to wait a long time for suitable cases, and when they do occur they are not under the skilled supervision which is desirable for scientific records.

Note.—The British Drug Houses, Ltd., have undertaken to place the preparation at the disposal of the medical profession.

Clinical and Laboratory Notes.

A CASE OF DISLOCATION OF THE RIGHT INNOMINATE BONE,

ASSOCIATED WITH LACERATION OF THE RIGHT KIDNEY.

By Richard Warren, M.D., M.Ch. Oxf., F.R.C.S. Eng.,
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Owing to its rarity this case seems worth recording.

The patient, a man of 21, was thrown from his motor-bicycle on March 11th, 1927, and crashed violently on his right side and hip. On admission he was in a condition of severe shock, pale, and almost pulseless. There was bruising of the right flank with rigidity and swelling. The right side of the pelvis was loose and there was an obvious hiatus in the region of the symphysis pubis. The pelvic condition was at first thought to be a fracture of the pelvis and a catheter was passed to ascertain whether the urethra was ruptured; bloody urine was drawn off but the urethra was intact. The pelvis was steadied with a firm binder and the patient treated for shock. The condition of shock persisted for several days and a large swelling was present in the right loin. It was daily debated whether it was advisable to explore the right kidney which was evidently

Radiogram showing displacement upwards of the whole right os innominatum.

lacerated, but conservative counsels prevailed—at first because it seemed that the least further interference might cause his death, later because he seemed to be getting better without.

The urine cleared and the renal hæmatoma slowly subsided. In a few days his condition permitted of taking a radiogram (here shown), when it was found that the symphysis had separated and the right sacro-iliac joint had given way. Attempts were made to bring down the ilium by weight extension and to draw the pubes together with a hip-band and elastic traction. It is pretty clear, however, from the later radiograms that but little was accomplished in this direction, although the gap between the pubes appeared on palpation to be much diminished when he left hospital. In February, 1928, he could walk some miles and had hardly any limp is now perceptible. The sacro-iliac joint is firmly united and there is calcified material (? bone) between the separated pubes.

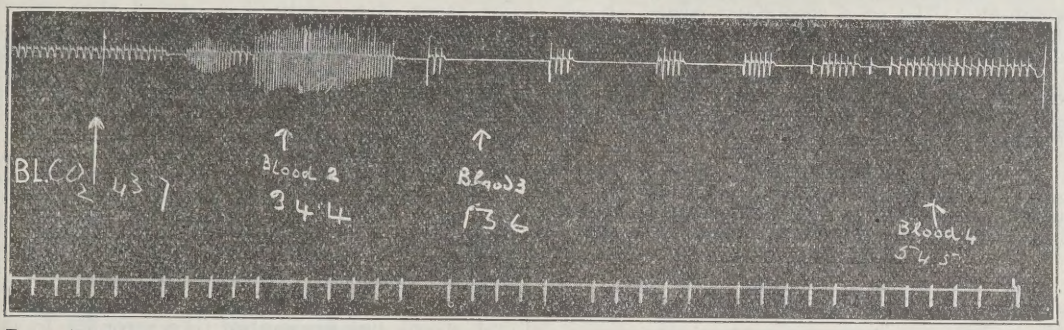
Thus treatment, which in the light of X ray finding seems to have been inadequate, has ended in a useful functional result.

RESPIRATORY ACTION OF LOBELINE IN THE DOG.

BY SAMSON WRIGHT, M.D., M.R.C.P. LOND.,
AND
F. R. CURTIS, M.Sc., M.B. LEEDS.
(From the Department of Physiology, Middlesex Hospital and King's College.)

IN continuation of our previous studies [1] we have made a more detailed quantitative examination of the respiratory action of lobeline in the dog anæsthetised with chloralose. The tracheal cannula was connected to respiratory valves of low resistance, which enabled the expired air to be collected at appropriate intervals in a series of Douglas bags; continuous sampling of the alveolar air was carried out by the automatic method of Wright and Kremer.[2]

From the results summarised in the table, it is clear that doses of 0·15 to 0·4 mg. lobeline per kg. body-weight produce, as a rule, in the dog under chloralose anæsthesia a marked initial stimulation of respiration. The minute pulmonary ventilation may increase five to ten times and in one case nearly 20 times; this result is due mainly to an increase in depth and to a less extent to acceleration of the breathing. The alveolar CO_2 may decrease by 1·4 to 3·7 per cent. of an atmosphere; as these figures represent the average composition of the alveolar air throughout the initial hyperpnœa, it follows that the level of alveolar CO_2 per cent. at the end of this period must be even lower than the figures noted.



Dog. Chloralose respiration. Intravenous injection of 3 mg. lobeline. Initial hyperpnœa followed by apnœa and Cheyne-Stokes breathing. Blood collected at points marked with arrows. Time in 10 secs.

The period of hyperpnœa in most of the observations is from 1 to 2·5 minutes; the CO_2 expired per minute may be two to four times the resting amounts. The total amount of CO_2 exhaled during this phase may thus be as much as eight or ten times the amount excreted during a control period of similar duration.

Dog.	Procedure.	Period (min.).	Pulmonary ventilation. Total (litres).	Pulmonary ventilation. Per min. (litres).	Respiratory rate per min.	Alveolar Co_2 per cent.	Expired Co_2 per cent.	Co_2 output per min. c.cm.	Remarks.
I. (10 kg.)	Control.	8	16·65	2·08	23	4·3	2·7	56·1	332 c.cm. excess CO_2 output—i.e., 332 c.cm. CO_2 expired during experimental period in excess of amount expired during control period of similar duration.
	,,	8	15·75	1·96	22	4·6	3·0	60·0	
	2 mg. lob.	2.30″	50·3	21·2	—	2·0	0·9	191	
II. (11 kg.)	Control.	10	10·5	1·05	16	4·9	3·2	33·6	
	2 mg. lob. (interval).	2	23·1	11·5	40	1·2	0·8	92.0	117 c.cm. excess CO_2.
		1							
		2	3·4	1·7	24	2·8	1·0	17·0	33 c.cm CO_2 retained.
III. (14 kg.)	Control.	8	21·3	2·6	—	4·8	3·2	85·1	
	2 mg. lob. (interval).	2	27·6	13·8	—	1·85	1·5	207	244 c.cm. excess CO_2.
		0.20″							
		2.30″	2·3	0·92	—	4·4	1·9	18	16 c.cm. CO_2 retained.
		3	9·75	3·25	—	3·82	3·5	122	111 c.cm. excess CO_2.
IV. (13 kg.)	Control.	15	35·6	2·4	22	4·6	2·85	68·4	
	2 mg. lob.	1.40″	18·0	11·0	40	2·7	2·0	220	250 c.cm excess CO_2.
		—	—	—	24	3·7	—	—	First 2 min. of this period.
		6	14·4	2·4	—	—	2·5	60	50 c.cm. CO_2 retained.
		—	—	—	24	3·8	—	—	Last 4 min. of this period.
	Control.	6	18·5	3·1	32	3·2	2·7	81	
	2 mg. lob. (interval.)	1.30″	27·8	18·5	52	1·8	1·5	277	290 c.cm. excess CO_2.
		45″	—	—	—	—	—	—	
		—	—	—	36	3·0	—	—	First 2 min.
		5.15″	15·6	3·0	—	—	2·2	66	80 c.cm. CO_2 retained.
		—	—	—	36	3·0	—	—	Last 1 min. 30 sec.
V. (11 kg.)	Control.	15	28·5	1·9	12	4·7	3·6	68·4	
	4 mg. lob.	1.25″	21·25	17	—	1·6	1·5	255	223 c.cm. excess CO_2.
		2.50″	3·3	1·18	—	3·4	2·4	28	150 c.cm. CO_2 retained. Apnœa present during early part of this period.
		1.15″	2	1·6	—	3·7	2·6	28	33·5 c.cm. CO_2 retained.
		4	12·6	3·15	—	—	2·1	66	
VI. (22 kg.)	Control.	6	18·75	3·12	21	3·1	2·5	78	
	5 mg. lob.	1.50″	32·1	17·5	—	1·7	1·4	245	306 c.cm. excess CO_2.
		2.4″	27·5	10·3	—	1·2	0·84	86·5	18 c.cm ,, ,,
		1.40″	26·8	16·1	—	1·0	0·92	148	116 c.cm. ,, ,,
VII. (kg.)	Control.	22	9·5	0·43	—	4·1	2·8	12	129 c.cm. excess CO_2; alveolar CO_2 collected during last 30 secs. of this period. Hyperpnœa was followed by 7 min. apnœa and then breathing resumed.
	3 mg. lob.	1.10″	9·65	8·3	—	1·5	1·7	141	

The hyperpnœa is, however, usually transitory and the ventilation rapidly decreases and soon falls to normal or below normal. In some instances apnœa may set in quite suddenly (and lasted 7 minutes in one instance) or Cheyne-Stokes breathing may develop (see the tracing which is here reproduced). During this period of respiratory depression CO_2 retention occurs and the alveolar and blood CO_2 levels begin to recover. Thus in the tracing the initial blood CO_2 (in volumes per cent.) was 43·7, after 1 minute hyperpnœa 34·4, soon after the end of the hyperpnœa 13·6, and when normal breathing was restored, following the phase of irregularity, 54·5. The alveolar CO_2 may rise however, though the ventilation remains above normal.

In some instances the initial hyperpnœa may be prolonged (dog VI.) or a secondary period of over-breathing may set in (dog III.).

The initial effects reported here are similar to those observed by ourselves [1] and Smith [3] in intact, decerebrate, or morphinised dogs; the secondary depression noted seems to be related to the presence of chloralose anæsthesia.

References.

1. Curtis, F. R., and Wright, S.: THE LANCET, 1926, ii., 1255.
2. Wright, S., and Kremer M.: Jour. Physiol., 1927, lxiv., 107.
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A CASE OF AGRANULOCYTIC ANGINA.

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Agranulocytic angina is a name first used by Schultz in 1922 to describe a symptom-complex whose essential feature is the association of a septic inflammation of the tonsils, pharynx, or mouth with a profound and increasing leucopenia, affecting especially the polymorphunuclear cells.

Acute onset, fever, and pronounced toxæmia appear to be constant features of the condition, and only less constant a failure to react to treatment and a fatal termination. Since 1922 a considerable number of cases presenting these features have been reported, chiefly by German and American observers, and the condition finds a place in American text-books of medicine. It is briefly mentioned in the third edition of "Osler and McCrae," but is not alluded to in other standard English text-books, and no case, at least under this title, appears to have been recorded in this country.

The nature of the condition has been discussed by several writers, among them Kastlin,[1] of Toronto, who reviewed 43 cases, reported by some 18 separate observers, and described in detail two cases of his own with the findings at autopsy. L. K. Gundrum,[2] of Los Angeles, reviewing the subject in March, 1928, mentions 47 collected cases, of whom 43 died.

No evidence that the condition is due to a specific organism is forthcoming. Smears and cultures from the mouth have generally shown a mixed infection, the bacillus of diphtheria and Vincent's organisms being absent, and although blood culture was positive in 9 of the 43 cases reviewed by Kastlin, the organisms grown were of four different kinds: hæmolytic streptococci, *Bacillus pyocyaneus*, staphylococci, and *B. coli*. On the evidence of these facts and of certain variations in symptomatology, Kastlin concludes that the condition is not a clinical entity, but that "the factors that bring about the clinical state must depend on an inconstant individual reaction to the etiologic agent." This may well be, but it is clear that the cases have a very strong family likeness and the clinical picture seems sufficiently clear to deserve a descriptive name pending further analysis. It cannot possibly be classed among the "terminal infections."

[1] Kastlin, G.: Amer. Jour. Med. Sci., 1927, n.s. clxxiii., 799.
[2] Gundrum, L. K.: Arch. Internal Med., 1928, xli., 343.

In addition to the essential features of the syndrome already mentioned, a number of inconstant symptoms have been described; but, with the doubtful exception of jaundice, which was present in 58 per cent. of Kastlin's cases, they are all such as may occur in toxæmic or septicæmic states, of whatever origin.

The distinguishing mark of the condition is the extreme leucopenia. Kastlin states that in two cases an initial leucocytosis has been observed, but within a day or two of onset a count of 1000 to 2000 white cells per c.mm. is usual, and this continues to fall, counts of 500 or fewer per c.mm. being not uncommon, with 100 as the lowest count recorded, while the percentage of polymorphonuclears falls to 15, 5, or even 0 per cent. in differential counts. In the few cases of recovery it is stated that the blood-picture has returned to normal. If the condition is to be ascribed to an abnormal reaction to an "ordinary" infection, the type of patient attacked, previous history, and state of health at the time of onset are of obvious importance. The patient is typically, but by no means always, a woman, and middle aged. Of Kastlin's 43 cases, 78 per cent. were in women, 22 in men. The youngest patient was 18, the oldest 74, the average age of the women was 46 and of the men 29. In 28 cases the disease occurred during good health; in 15 after a longer or shorter period of impaired health due to a variety of causes. Seven of the 43 had had previous oral infections, and one case is on record of a patient who recovered from first attack but succumbed to a second. In none of these cases is there a history of preceding asthma or other "allergic" disorder. In all cases the onset, whether during good or impaired health, was acute with high fever.

At autopsy the only characteristic feature is, apparently, a hypoplasia of the bone-marrow "with almost total absence of granulocytic cells" (Kastlin), the other findings being those associated with death from toxæmia or septicæmia. A broncho-pneumonia in which the alveoli were filled with fibrin, serum, and red corpuscles, leucocytes being absent, was found in one of Kastlin's cases, and it seems probable that pneumonia, when it supervenes, would be of this type.

The case that follows presents the essential features of the syndrome and in all respects very closely resembles many of the recorded cases.

The Case Described.

The patient was a lady of 50, the mother of ten healthy children, and a very capable mistress of a large household. For the last eight years she had had a mild chronic asthma with occasional acute attacks. These responded well to adrenalin, but she was rarely free from slight asthma or dyspnœa. In other respects she had good health and had not before showed evidence of defective resistance to infection. During the last six or eight months she had had more than her share of anxiety and worry for various domestic reasons, and in August, 1928, while away on holiday, she had an attack of acute pharyngitis with fever, but recovered without incident. No blood count was done on this occasion. At the end of October she was troubled with neuralgic pains in the head but appeared otherwise to be in her usual health. On Nov. 7th, in the evening, she felt chilly and ill and went to bed, taking a tablet of one which had been prescribed for her in her previous attack of pharyngitis. In spite of this she spent a wakeful night, and I was called to see her on the morning of the 9th. She was then very drowsy, out of proportion to the hypnotic taken. Her temperature was 102·8° F., pulse-rate 120, respiration-rate 32, and the breathing slightly asthmatic. Herpes was present on the lip and left nostril. The mouth was dry with sticky mucus between the tongue and palate, the pharynx was red and swollen, the tonsils especially so, a little white exudate was present on the right tonsil, and the tonsilar glands were palpable and slightly tender.

The heart and lungs showed little abnormal, the urine a haze of albumin. A swab was taken of the tonsilar exudate and sent to a pathologist, who reported in the film streptococci, Gram-positive and Gram-negative bacilli, and a few spirilla (the latter not typical of Vincent's angina), and in culture non-hæmolytic streptococci and diphtheroid bacilli but no *Bacillus diphtheriæ*.

Fever and drowsiness with inability to sleep continued, the throat became sore, and shallow ulcers began to form on the tonsils. On the evening of Nov. 10th a raised, blotchy

ythematous rash appeared on the buttocks and backs of e elbows and spread rapidly over the legs, arms, and fore- ms, with a simple erythema of the palms of the hands. he rash came out quickly and then partly faded, but turned later in the illness.

The blood was first examined, after a consultation, on ov. 11th. The count showed: red blood cells, 3,800,000. r c.mm.; hæmoglobin, 68 per cent; colour-index, 0·9; hite blood cells, 2100 per c.mm.; polymorphonuclears per cent.), 20 per c.mm.; lymphocytes (93 per cent.), 50 per c.mm.; large mononuclears (6 per cent), 130 per mm.; no eosinophils or basophils. No abnormal red or hite cells seen. Blood culture was negative, and a second roat swab confirmed the results of the first.

From this on, the disease ran a slowly progressive course. ever continued, ranging from 100° to 103° F., the allow tonsillar ulcers extended and involved the right ucial pillar with, later, a small ulcer on the tip of the ngue, the tonsillar glands remained slightly enlarged and nder, but there was no attempt at suppuration, no œdema the neck, no dyspnœa, and no marked dysphagia. The buminuria increased somewhat and was accompanied granular casts. The herpes labialis increased. Inability sleep and discomfort in the nose and throat were the tient's chief complaints; she appeared gravely ill, but ok nourishment well and did not lose flesh.

A second blood count on Nov. 15th, 18 hours after a ood transfusion of 400 c.cm., showed: red blood cells, 960,000 per c.mm.; white blood cells, 500 per c.mm.

On the evening of Nov. 17th an abrupt rise of temperature 104·4° F., with rapid breathing and the expectoration of thick, ropy sputum seemed to indicate the onset of pneumonia, but no corresponding physical signs were found then or later in the chest. A film of the sputum showed inspissated mucus with a minimum of cells. No jaundice, hæmorrhages, petechial or other, or enlargement of spleen or liver appeared.

Treatment, except in the alleviation of symptoms, appeared to be entirely without effect. At an early stage a sensitised streptococcal vaccine was given in doses up to 500 million daily, two blood transfusions, one of 400 c.cm. and one of 500 c.cm. were given, but without reaction or apparent benefit; paints, sprays, and gargles did not appreciably alter the condition of the throat. Antistreptococcal serum was at first withheld for fear of producing anaphylactic shock in an asthmatic subject, but was ultimately given in doses rising to 10 c.cm. three-hourly, without reaction or effect. Such signs of asthma as occurred were easily controlled by adrenalin, and sleep was secured by injections of omnopon. The patient became increasingly exhausted and drowsy and died on Nov. 20th after 12 days' illness.

The case described is typical of the condition known in Germany and America as agranulocytic angina. Since its recognition depends on the blood count, and the disease is not of a kind generally admitted to hospitals, it may well be less uncommon than the literature suggests. This case is reported in the hope that others will be recognised and noted and light ultimately be thrown on the ætiology and treatment of this obscure disease.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

At a meeting of this Society held on Feb. 25th, r. J. Walter Carr, the President, being in the air, Prof. A. H. Burgess (Manchester) introduced a scussion on

Acute Intestinal Obstruction.

ne present century, he said, had seen a great provement in the surgical treatment of acute dominal crises; this applied to nearly all groups, t least of all to acute intestinal obstruction. Manchester Royal Infirmary the mortality from ute appendicitis in 1924 was only one-twelfth what was in 1900; that from perforations of duodenal d gastric ulcer was only one-seventh in the later ar of what it was in 1900, whereas the mortality m acute intestinal obstruction had only been luced by half in the same period. Mr. H. S. Souttar d lent him the figures compiled for the British edical Association meeting in 1925, the largest ailable on the subject. It represented five years' tistics of seven hospitals—three in London, three the provinces, one in Ireland. He hoped Mr. uttar would compile a similar table at the end of 29; these would be classical for another decade.

Mortality.—For the purposes of the present dis- ssion Prof. Burgess omitted from these 3064 cases strangulated hernias and the acute intussuscep- ns. There was no excuse nowadays for anyone ssing a case of obstruction from strangulated nia; nor, indeed, of acute intussusception. More- er, the latter was not primarily an obstruction; the ject of early treatment was to prevent obstruction llowing the intussusception. Excluding those, there re left 1042 cases, giving 395 deaths, or a percentage rtality of 37·9. It was this mortality that surgeons re out to reduce, the death-rate of cases of the dition which were not readily obvious, and in ich there was some excuse for not making an mediate diagnosis. At the Royal Infirmary, nchester, from 1913 to 1922, the mortality was 1 per cent., while in 1925–27 it was 30·2 per cent. What was the reason for this high mortality? He not doubt that the main reason for it was delay carrying out the only treatment which could do d, the surgical. Still too many cases were being n only after the onset of a marked distension and toxæmia, when there existed what was termed fæcal vomiting. He contended that the early signs of acute intestinal obstruction had not been sufficiently stressed in the text-books, or at least not until the more recent ones were published. Too much stress was laid on the presence of fæcal vomiting as a sign of the condition; but that was not so much a symptom as an end-result. There was a tendency on the part of many to wait for the development of fæcal vomiting before diagnosing intestinal obstruction. The man who waited for the perfect clinical picture would rarely save his patient.

Primary or Secondary.—Acute intestinal obstruction might be either primary or secondary; in other words, it might occur as a bolt from the blue, or be a process engrafted upon a previously existing subacute or chronic condition. In the latter were two features which were never present in the primary. One of these was that it was frequently possible to see the outlines of individual dilated coils of intestine, and to see peristalsis. Sudden, acute obstruction always led to dilatation and thinning of the wall, never to visible peristalsis. Of course, in very thin people, such as those recovering from an exhausting illness, peristalsis could be seen apart from obstruction, but then it was occurring in normal-sized coils. When a peristaltic wave could be seen passing dilated coils, one could be sure it was a case of obstruction which had existed at least several weeks. Even when peristalsis was not actually visible, it could often be made evident by keeping the hand on the abdomen; a coil could be felt to be alternately hardening and softening. Primary acute intestinal obstruction varied in acuteness of onset. It was very acute in internal strangulation, or intussusception, or volvulus. In other types its development might be somewhat slower. Only in types associated not only with obstruction to the lumen of the bowel and interference with the blood-supply was the onset really acute; the latter factor was by far the more important. Fæces could be arrested for days, even weeks, but no patient could go on long with complete arrest of circulation. In general terms, the higher in the bowel the seat of obstruction the more acute were the symptoms, the only exception to that being the case of volvulus of the sigmoid, in which there was associated damage to a large extent of mesentery.

Early Symptoms.—The early symptoms of acute primary intestinal obstruction were those common to any other acute abdominal crisis; they were described many years ago by Sir Frederick Treves under the term "peritonism." They were, however, of no localising value. In this acute condition the pain

was always referred to the epigastric region, and hence it did not indicate the seat of the trouble. Often the pain was paroxysmal at first, and as the obstruction became complete, pain became continuous. The vomiting was, at first, entirely of a reflex character; later it was due to mechanical obstruction. The higher the site of the obstruction, the earlier did vomiting set in. Vomiting was a marked symptom when there existed high jejunal obstruction. When it was quite low down in the bowel vomiting might be absent throughout. True fæcal vomiting did not occur in acute intestinal obstruction, only when there was a fistulous communication between the colon and the stomach. Vomiting of true fæces, however, had been described apart from any obstruction at all. The important point about the vomiting was not so much its character as its persistence. Early in the case the cessation of the passages of fæces and flatus might not be absolute, because at the moment of obstruction the portion of intestine below the obstruction might contain quantities of fæces, and one, or even two, enemata might bring away fæces and gas. Unless this was borne in mind, the nature of the case might be missed.

The other symptom was active distension. Distension of a coil above the site of the obstruction must be present in every case of obstruction, though it was not always visible. The vomiting and the distension varied inversely. Another point about the distension was its shape. When it occurred in the sigmoid, there was the characteristic flattening of the flanks and the barrel-shaped abdomen; when the obstruction was in the small intestine, one found a prominent central distension. Volvulus of the sigmoid was an exception, for there, though the obstruction was low down, distension came on very rapidly. This distension was the most unfavourable feature in connexion with intestinal obstruction; it rendered operation more difficult, increased the degree of shock, and rendered it almost impossible to prevent collapse of the bowel.

Palpation might sometimes reveal the presence of a tumour in acute intussusception and in malignant disease. There was marked tympanitic resonance over the distended portion. He made a plea for auscultation of the abdomen, as he had found it of great value in the diagnosis of intestinal obstruction. There were certain sounds, which could not be mistaken, indicating the passage of fluid contents in a distended cavity which contained a considerable amount of gas, a kind of bell-tinkling sound.

Rectal examination was very important; if there existed a stricture or growth in the rectum, it could be felt, and sometimes through the rectal wall one could feel a mass in the sigmoid which had prolapsed into the pelvis. Frequently ballooning of the rectum could be made out, it was often associated with a growth in the upper sigmoid region. When obstruction was suspected in the large intestine, sigmoidoscopy should always be carried out; the instrument could be passed 9 to 11 inches, and, from a negative point of view, it was valuable to be able to say that within that area there was no obstruction.

Site of Obstruction.—With regard to diagnosis of the site of the obstruction, sometimes a palpable tumour in the abdomen furnished the guide; or if the case should be seen early enough, one might be able to say where the local distension started. Mostly, when the case was seen, there was no such guide, and all one could determine was whether the obstruction was in the large or the small intestine. In Mr. Souttar's list there were 586 cases in the small intestine, 433 in the large; roughly, the chances favoured the obstruction being in the small rather than in the large bowel. When the medical history revealed previous indigestion or obstructive troubles it strongly favoured the obstruction being in the large intestine; when the obstruction occurred suddenly, the site was more likely to be the small bowel. The key to the position was the condition of the cæcum. If the obstruction was in the colon, the cæcum must be distended, unless there was a growth of the cæcum itself; then it would be palpable. If the obstruction was in the small intestine, the cæcum must be prolapsed. Often before operation it was possible to say whether one was dealing with colonic or small intestine obstruction. If obstruction could be definitely located to the large intestine, it was 9 to 1 chance that the case was one of malignant growth. If one could determine that the obstruction was in the small intestine, the odds were 300 to 1 against it being malignant growth.

Treatment.—With regard to treatment of true mechanical obstruction (he omitted paralytic ileus) there was really only one treatment—namely, the operative—though there were accessory methods, such as stomach lavage, and the exhibition of large quantities of fluid, as much fluid was lost in vomiting. And because of the loss of chlorides, hypertonic saline should be given. And anti-gas-gangrene serum was valuable, because many of the symptoms were due to *B. welchii*. Another treatment was by enemata of bile. The nature of the operation would depend on the stage of the disease. Seen early, with but little distension, and the patient in good general condition, the treatment was ordinary exploratory laparotomy. Before the anæsthetic was given the stomach must be washed out, and if possible, spinal anæsthesia should be selected; controllable spinal anæsthesia had given better results in his hospital during the last nine months than any form previously used. He preferred the right paramedian incision, going straight for the cæcum, to see whether it was distended. Next, he removed the obstruction or short-circuited it, or made an artificial anus above the obstruction. If seen in a late stage, with much distension, the less one did, provided it was effective, the better. The patient could stand but little manipulation. He usually contented himself with doing a valvular or "blind" cæcostomy; it afforded relief, and the patient would not die of obstruction.

Discussion.

Mr. C. H. S. FRANKAU emphasised the necessity of differentiating between the two types of acute intestinal obstruction, that of gradual onset due to growth, and that in which the blood-supply of the bowel was interfered with by a band. When there was complete obstruction of bowel contents and no interference with the blood-supply, toxæmia intervened only at a later stage. In the case due to strangulation there was sudden pain, and shock was profound from the start. The rapidity of the acute symptoms was largely due to the rapid multiplication of anaerobic organisms. This was pointed out to him by the late Mr. Clinton Dent, who therefore advocated the injection of hydrogen peroxide after relieving the obstruction. He declared himself to be against the performance of "blind" cæcostomy. Only once had he done it in 18 years, and then it was not in a case of obstruction; the patient had uræmia and was blown up by constipation. At the post-mortem the suspected growth was not found. In obstruction due to a strangulating band, diagnosis in the early stage was often difficult; there was danger that the case might be regarded as colic or food-poisoning until too late. Obstruction by bands was the more likely diagnosis if the patient had had a previous operation on the abdomen. In acute intestinal obstruction the pulse steadily rose and the tongue rapidly dried. A succussion splash could be elicited. During an attack of pain a coil of intestine could be felt to harden under the finger; if it was so hard when the patient vomited, that was confirmatory. An acute case caused by a band had a grim prognosis. In food colic there was never absolute constipation, and the intestinal movements were more marked than in some cases of intestinal obstruction. Anti-gas-gangrene serum was valuable, and it should be given in large doses. On the principle that it was unwise to flog a tired horse, he thought eserine, pituitrin, and similar drugs were best avoided. If drugs at

l were used, the best was magnesium sulphate in drachm doses, to assist the action of enemata. eus might follow injury, as after a fractured pelvis a gun-shot wound, or after a kidney operation which there had been a good deal of manipulation, after a fractured spine with a cord lesion. Another oup was the post-operative, in which there was no ıtecedent peritonitis and none subsequent to the peration. A third form of ileus was that which as a sequel to peritoneal inflammation. He referred the acute distension which occurred after removing gangrenous appendix. Ileus, the result of injury, as troublesome, and might be persistent, but it was rely fatal. It reacted to stimulants of the intestine, ch as eserine. He thought it probably followed terference with sympathetic plexuses. The second pe, after a simple straightforward abdominal peration, in which there was neither hæmorrhage r shock, and which was difficult to explain, was ore serious He thought it had something to do th the anæsthetic. Nowadays, anæsthesia was ore skilful, and patients got more oxygen, and the currence of this was rarer. Human bile given to e patient often had a dramatic result for good; d the actual cautery to the abdominal wall some-nes caused a profound effect. In a third type, in ıich ileus followed on definite peritonitis, fluid ould, if possible, be given by both mouth and rectum. ıch operations as lateral anastomosis did not appeal him.

Mr. HERBERT CARSON said it was well to remember at the higher the obstruction the more definite e symptoms, and the lower the obstruction in the wel the more definite were the signs. He agreed at the present death-rate from hernia and intus-sception was much lower than some years ago. hy, he asked, did people die of intestinal obstruc-n? He did not think that was known. In the e stage the patient had an extraordinary condition toxæmia, and at the end death came suddenly, nost unexpectedly. He thought it must be due absolute poisoning of the heart muscle. The privation of bile theory did not satisfy him, but illiams's gas-gangrene theory did to some extent, he had derived remarkably good results from using anti-gas-gangrene serum, and the wounds had aled up surprisingly quickly. In order to ascertain urately what killed these patients, he thought earches should be made into the condition of the od plasma. At the present time, in association h a pathologist at the Montreal General Hospital, angements had been made to examine the blood sma of cases before anything was done, and again er the operation, and after the administration of i-gas-gangrene serum, to see if, and in what y, it was altered. Until the actual cause of ıth was known, it would be difficult to find the ıedy.

Mr. T. H. C. BENIANS said his feeling was that the m toxæmia was one which was loosely used by geons generally. The toxins which worried were se which were of the neurotropic type, because en they had arrived in a nerve path they seemed be out of the reach of antitoxins. If, on the other ıd, the toxin was in the blood stream, antitoxin ıtment was much more hopeful. He had been king at the subject from the point of view of oxicating diphtheria.

Mr. ZACHARY COPE spoke highly of the value of i-gas-gangrene serum in cases of intestinal obstruc-ı, even in fæculent vomiting in post-operative s. The condition had got well without ileostomy. such case he would have given four hours to live, decided to give the serum, and after two doses dirty sloughy condition cleared up and the patient well. He urged a careful noting of the patient's tolic blood pressure when estimating what could ndured in the way of operation, paying special ntion to the difference between the systolic and diastolic.

Mr. HOPE CARLTON spoke of a sign he had ned abroad was that in primary pneumococcal or streptococcal peritonitis there was a great increase in the conduction of vocal sounds from the chest through the abdomen as heard over the symphysis pubis.

Mr. A. E. ROCHE thought cases of intestinal obstruction would be brought earlier under active treatment if there was less concentration on thinking in terms of distension and late vomiting. Rutherford Morrison's rule was, that if peritonism occurred, as shown by sudden acute abdominal pain, with nausea and vomiting, and had existed six hours—other conditions such as tabes and colic being excluded—it was an indication that something serious had happened inside the abdomen. Pulse indications were not always devoid of fallacy, and it was possible to wait too long for the supposed characteristic pulse.

Mr. DICKSON WRIGHT discussed the desirability of washing out the stomach with sodium bicarbonate. Steps taken to overcome alkalosis were the administration of ammonium chloride and the giving of hypertonic saline solution, either intravenously or per rectum.

In his reply Prof. BURGESS defended his attitude towards the performance of blind cæcostomy in patients whose condition was precarious owing to intestinal obstruction.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

A MEETING of this Section was held on Feb. 26th, the chair being taken by Dr. ROBERT HUTCHISON, Vice-President. Prof. KARL HANSEN (Heidelberg) read a paper on

ALLERGIC AND PSYCHICAL FACTORS IN ASTHMA.

Asthma, he said, was a clinical term embracing a whole distinct symptomatology and implying neither uniformity nor specificity in ætiology. After excluding the similar forms—cardiac, uræmic, and hysterical asthma—clinicians considered bronchial asthma as a pathogenic entity, characterised by spasms of the bronchial muscles and increased exudation, symptoms which were now known to be the expression of an aggravated excitement of the parasympathetic system. Recent researches had shown that the cause of this neurosis of the vagus lay deeper and that an exogenous releasing physical factor could be made responsible for many cases. This factor was the allergen, the absorption and peculiar assimilation of which brought about the disposition to attacks and the attacks themselves. It was not yet known whether all cases of bronchial asthma had some allergic constituent, therefore non-allergic forms must be distinguished. The classification of bronchial asthma as an allergic problem was a most important step towards understanding its pathology, but it needed supplementing, and seemed destined to bring us nearer the solution of a deeper and more general problem—that of the biological psycho-physical unity of the person.

After outlining the history and theoretical foundations of allergy, Prof. Hansen said that the identification of a disease as allergic depended on (1) the exact anamnesis, (2) the positive result of the cutaneous reaction, (3) the passive transferability of the cutaneous reaction to healthy persons through the serum of the diseased person, (4) the inspection of the patient's environment and the proof of the existence of specific allergens in it, (5) the exposure experiment, and (6) the disappearance of symptoms after the removal of allergens from the neighbourhood of the patient. None of these signs was alone infallible, but careful correlation of them gave a high probability of correct analysis of the allergic factors at any given time. Undoubtedly most sedulous attention should be paid to the exogenous allergic factor, but

it was clear that the presence of allergens in the environment of human beings did not necessarily produce an attack of illness. Only about 1 per cent. of people seemed to have any disposition to allergic diseases, and the tendency was usually found also among their antecedents. The conclusion that they had inherited a particular constitution was, however, only partly true, since Bloch and Karrer had shown that nearly every human being could be forced to an allergic reaction with chemically pure primrose poison. The frequency of allergic diseases depended largely on the amount and concentration of the absorbed allergen. Nevertheless, even sensitive patients could at times stand the presence of allergens without manifesting any reaction. This might be ascribed to temporary immunity, as seen in animal experiments and as used in J. Freeman's therapeutic method, successful in 80 per cent. of cases. The hypothesis of temporary immunity, however, did not explain the apparently incidental and haphazard rise and fall of many allergic symptoms. Other factors had a determining effect, especially exogenous factors which were easily overlooked—the change in the specific conditions of the resorption of allergens. Often an illness began when new conditions of resorption occurred—e.g., a workman had used ursol for years for dyeing furs, but got asthma the day he first tried to apply it with a spray instead of a paint-brush. In spite of a correct estimation of the exogenous factors, however, some endogenous ones seemed to play a part e.g., acclimatisation and influences of periodicity.

The Significance of the Psyche.

By the study of the functions pathological physiology had extended the pathology of the organs to a pathology of the body which was affected by every disturbance as a whole. This pathology was bound to the principle of the physico-chemical unity of the functions, but in this was expressed a higher principle—that of the manifestations of life in an individual, the principle of the person. The person alone was in the proper sense the subject of observation and treatment. Every pathogenic research which aimed at being the "pathology of the person" must take into account the relations of the psyche to the body as well as of the physico-chemical functions. Obviously such a comprehension of the patient was liable to serious errors. There was no means of measuring the strength of the psychical excitation and no possibility of finding a psycho-somatic energy formula. Fixing the psychical factor in itself paved the way for all kinds of deception of oneself and others; how much more dangerous, therefore, was the interpretation of its range of influence. One could only build with the greatest care and judgment and take into consideration cases where the proofs of psychical influences were overwhelming. Could it be proved that psychical factors influenced the disposition to disease in the face of known pathogenic substance affecting the organs; if so, how was it to be understood? For such a study nothing was more suitable than the allergic diseases, the dependence of which upon psychic influences was well known. Asthmatics often gave evidence of a "nervous" constitution, and hypnotism might do away with attacks for a longer or shorter time. The investigator wanted to know whether the patients acquired through psychological influences a resistance to or a tendency towards the allergen which partly constituted the attack. Success had attended a few experiments in which patients inhaled allergen in the hypnotic state or were protected from attacks by post-hypnotic suggestion, but in each patient other indeterminable influences had been at work. More convincing was a case in whose life-history the dependence appeared as a compelling force.

Prof. Hansen then related the history of a woman of 49 who had had asthma since the age of 10 but only at certain periods of her life, while at others it had completely vanished. She was sensitive to horse-dandruff and bed-feathers and had emphysema, but no sputum. A survey of her psychological history showed that the illness always set in when a situation was created which awakened a severe inn conflict from which she could find no escape. Wh the crisis was over the attacks stopped, whether t patient had found a real solution or apparent reli through transference. Her dreams clearly expresse the position.

The Correlation of Psychic and Allergic Factors.

Might not the pathological symptoms be co sidered simply as expressive movements, independe of any organic cause? A pathology of the pers would never reject the question of the "meaning of a symptom. A number of neurotic symptoms h a meaning, often unconscious, and the discovery the meaning often gave a pathogenetically sufficie explanation for them. The problem, however, w somewhat different when the symptom was co nected with a distinct organic defect. It was by means always true that the proof of the organ defect alone could explain the dependent symptom for these varied in intensity according to "moods and had a psychologically expressive meaning. all cases of genuine idiosyncratic forms of disease must proceed with the greatest caution in evaluati the symptoms as specific expressions. This patie had been definitely sensitive to a common allerg but had only succumbed to attacks under t impression of certain experiences. That such expe ences gained a sensitising preparing power did n lie in their subject matter alone, but had its reas in the much more general biographical significar which they acquired in the particular situation of t person for his development. The problem of po choreic motility derangements was one of the sa kind. In asthma there was an ever-renewed intrusi of morbific germs (the allergen) into the organis but these agents only led to illness when they fou the body prepared by certain psychical experienc The aim of the paper had been to show that diseas the incitement of which was manifestly subject t pathogenic physical components, were also ab lutely dependent in their course, even in their orig on special psychical influences acting on the patie We could not yet say what organic links the m used to prepare the body, but the vegetative nerv system played a most important part. It was a system over which the will had no control and wh was particularly determinable by psychical influen The clinician could not go too far in analysing these threads, both psychic and organic, but would only get an incomplete view of the wh unless he recognised the principle of the biolog unity of the person.

Discussion.

DR. MILLAIS CULPIN said that attempts to corre the psychical and allergic factors in asthma w almost unknown. He recalled two cases simila that of Dr. Hansen. In patients subject to pat logical states of anxiety there occurred, in resp to specific or non-specific stimuli, attacks of *angs* anxiety (there was no exact English equivalent which the objective signs of extreme fear w manifested. In some patients the symptoms appea not as *angst*, but as attacks of cardiac or gas intestinal disturbance. Like asthma, they migh cured by elucidation of the significance of the stin or they might respond to any one of a multitud therapeutic measures, or disappear spontaneou The physical symptoms might act as the equivale anxiety; while the patient had cardiac, gas intestinal, or respiratory troubles he might be from sensations of fear. The psychologist hac explanation why one patient should develop *ast* another faintness and palpitation, another ner polyuria, and another asthma when some stim stirred up an emotion unfitted to the circumsta At present the allergic phenomena were to be i preted as freakish manifestations of a biocher Puck; any hypothesis that could correlate them other manifestations should be welcomed by chemists. Help in correlating them with ps factors might be found in Pavlov's studies of

onditioned reflex. In the presence of emotionally abile physiological reactions the setting up of a onditioned reflex might take place through allergic nechanisms. There was urgent need for coöperation ather than opposition between those working at lifferent aspects of this problem.

Dr. R. D. GILLESPIE said that psychologists in this ountry had not much opportunity of seeing sthmatics, and there were few references in the iterature to the purely psychological aspects. Psycho-enic dyspnœa was not asthma, and the asthmatic ype of dyspnœa was not part of the normal emotional eaction of *angst*. It seemed most probable that the sthmatic paroxysm was a constitutional peculiarity hat was set going by physical or psychical factors.

Dr. E. P. POULTON related two experiences suggest-ng a psychological factor in migraine, and Dr. . ORIEL described a mother who had developed rticaria while her daughter got angioneurotic edema after the former had been chased by her usband with a revolver. The daughter had at the ame time become egg-sensitive, but had lost this ensitivity when the parents had obtained a divorce.

Dr. A. CAWADIAS said he had seen asthma develop fter strong emotion, but the patients had reacted o allergens and had been cured by diet and auto-æmotherapy. The mechanism of correlation of sychic and allergic factors would probably be found hen our ideas of the vegetative nervous system were nore complete. There was probably a real organic eurological explanation of these cases—a fibre-onnexion between the cortex and the viscera.

Dr. PARKES WEBER said that it was difficult to et away from the fact that psychical factors nfluenced asthma—among other diseases. The eaction towards any psychic factor of disease epended partly on the nature of the factor, but also rgely upon the pattern of the individual, in many ases the pattern of the vegetative nervous consti-ution. The reaction varied according to the seed nd the soil, and was exactly analogous to the ffect of all physical agents, especially the milder athogenic ones. There was no reason why asthma ould be an exception to the general rule.

Dr. GEORGE GRAHAM asked what part adrenalin layed in the reaction.

Dr. HAROLD AWROUNIN said that the sympathetic ervous system must be associated with the asthmatic tack, acting, probably, on the finer capillaries as it d in angioneurotic œdema, urticaria, perhaps in igraine, and probably in mucous colitis. This was hy atropine and adrenalin were of value.

Prof. HANSEN, in reply, emphasised his opinion that finite sensitivity to certain substances only produced sthma if certain psychogenic factors were present, erefore the psychogenic factors influenced an illness organic origin. Many allergic phenomena that re attributed to psychical origin might be traced organic causes if research were continued. As any asthmatic reactions were not allergic at all, it as impossible at present to make any precise atement.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

A MEETING of this Section was held on Feb. 22nd, . G. E. WAUGH, Vice-President, taking the chair. . GERALD SLOT read a paper dealing with

THE WORK OF A RHEUMATISM SUPERVISORY CENTRE.

e had been impressed, he said, with the increasing portance of rheumatic fever in this country. ace the disease had been taken seriously among the hool medical services 9000 cases had been istered; probably there were 24,000 in London ne. Cases came to a clinic from four sources: erred by school medical officers through the care mmittee; from private practitioners—and these increasing numbers; by voluntary application of parents to the head teacher; and as ordinary -patients to a hospital. The duties of a rheumatism supervisory centre were: (1) The supervision of children suffering from rheumatic manifestations. (2) Recording on the school record card, or writing to the doctor or in some other way noting definitely whether or not the child was rheumatic. This was in many cases impossible, but at any rate the centre acted as a second opinion and was able to save unnecessary invalidism. (3) Instruction of parents on the importance of rest, modes of hygienic living, and the severity to the child's future of neglecting rheumatic disease. (4) The keeping of accurate records; these were usually based on Dr. Reginald Miller's schedule. (5) Arranging for treatment, whether by the private doctor, by a local hospital, or at one of the Metropolitan Asylums Board special hospitals, or in the local infirmary. In some districts the infirmary would arrange for continuing treatment under the doctor in charge of the centre. (6) Arranging for convalescence, and for reports from the convalescent home to complete the records. (7) Arranging the treatment of minor maladies, such as unhealthy tonsils. (8) Acting as a centre for research. The physically defective schools were an important element in the life of a rheumatic child, who could be sent to one of these on his return from the convalescent home. There he had no stairs to climb, education was not pressed, he could be taught a trade, and under statute law he could be kept until he was 16, so that his lost education was made up. The mortality before the age of 25 of cardiac children trained at physically defective schools was about 50 per cent.; of those sent to elementary schools it was about 80 per cent.

Method of Estimating Cardiac Efficiency.

The aim of a cardiac test was to secure some objective method of estimation which could be used to determine the efficiency of a heart on more than one occasion and by which a second observer could estimate the changes noted by the first. Vague terms and varied opinions made it very difficult to trace the history of a heart through other people's notes. The six factors taken were: reclining pulse-rate, standing pulse-rate, difference between reclining and standing pulse-rate, pulse-rate after standard exercise (touching the toes 20 times), time in which pulse-rate returned to normal, and difference between standing and reclining blood pressures. The fact that the nurse could take the pulse-rate obviated errors due to excitement at the doctor's visit. A system of marks varying from 3 to −1 was allotted to each test, so that a maximum of 18 could be obtained. Eight marks constituted a pass, 7 was doubtful, and below 6 some cardiac damage was indicated. The test was subject to the fallacies of all numerical tests, but had been based on a large number of cases, and it did give an index by which progress could be gauged from time to time. It was essential that the elements of a test should be obtainable in any bedroom, and elaborate clinical methods were therefore inadmissible. The test was especially useful in those cases where there was a rapid heart but nothing else. The heart that gave a poor response to the test often developed symptoms of damage later on. The scheme was put forward with all reserve and with no claim at all to finality.

Discussion of the Cardiac Test.

Dr. D. W. WINNICOTT described the points in which his rheumatism clinic at Queen's Hospital differed from that of Dr. Slot. They were particularly trying to avoid seeing too many children; they hoped to see a few very carefully and in time to be able to draw conclusions. He had not tried blood pressure estimations, but had found that the pulse-rate test was liable to fail just when it was most wanted. A child who did not seem frightened at the examination, whose fears were not quite conscious, might have flushed pallor, trembling, fever, and even growing pains, and might respond very badly to pulse-rate tests and yet never develop rheumatic disease. The pulse-rate might be lower in sleep, but some of these

children allowed themselves no quiet even in bed; they had nightmares and ran a rapid pulse all night.

Dr. ADOLPHE ABRAHAMS said that these tests did not test the heart qua heart and, in his experience, would break down in both directions. People who did badly at tests might be capable of considerable exertion, and vice versa. It was impossible to disregard the nervous factor. The problem of response to exercise was not merely one of the heart's efficiency, but was bound up with many other factors. These tests showed the efficiency of the individual for exercise, or perhaps just the tone of the vasomotor system. If tests could be devised to estimate the heart's efficiency they would be of great value.

Dr. MARGARET LOWENFELD described an attempt in Glasgow to estimate the efficiency of the heart in a large number of normal children of both sexes between the ages of 6 and 13. The work had been abandoned because of the extraordinary variety of results obtained. For instance, a perfectly healthy child of good heredity had given bad test results; it had subsequently been ascertained that she had that afternoon learned of her success in terminal examinations and the excitement had caused her heart to fail in the tests. A series of rheumatic children with definite cardiac affection had shown the converse; a child with considerable enlargement and a double mitral lesion had given a perfectly normal reaction after moderate exercise. Without a very careful examination into the neuro-physical character of the child illusory figures would be obtained from tests of this nature.

Dr. B. E. SCHLESINGER said that the physician of the convalescent home often had great difficulty in securing proper attention to the children after discharge if they could not be put under a supervisory centre. He thought that the American statistics were so elaborate and overwhelming that workers were likely to get lost in them. All kinds of factors entered into the pulse-rate, such as the time of day it was taken. As in "soldier's heart," recovery of rate and efficiency might occur with improvement in the general health. The problem was not so much one of testing cardiac efficiency as of recognising signs of rheumatic activity, and that would not be done by these tests. Much harm had been done by keeping children at rest for long periods unnecessarily. A point that might be of use was that the normal pulse-rate dropped 10 to 20 beats during sleep, while the night pulse-rate of the rheumatic child with active carditis approached that of the day.

Dr. T. W. PRESTON remarked that criticism of the paper seemed to be destructive rather than constructive. No one had suggested that a diagnosis could be made on this test, but in the majority of cases a heart that could pass it satisfactorily was a good heart. There might be exceptions, but as a rule the heart that was constantly rapid after exercise had something the matter with it. He would like to know how these "normal" children with hearts that failed to pass the test got on years afterwards; did they live to old age without any cardiac trouble? He had found these tests a very considerable help, and it would be unfortunate if the report went out that the meeting was unfavourable to them. The practitioner wanted to know how to keep a doubtful heart under observation, what he was to look for; a routine test of this kind would give him a great deal of assistance.

Dr. BERNARD MYERS asked whether the size of the collar round the arm made any difference to the blood-pressure readings and whether the instrument had been tested at Kew. Dr. Parsons Smith had been working at children's blood pressure and had found tremendous differences. The nervous child was a most important source of error. It was doubtful if any test would be of real solid value unless it could estimate the effective action of the pituitary.

Dr. E. A. COCKAYNE said he had tried some of these tests on soldiers and had been struck by the way in which patients with organic disease might pass them quite well, whereas many who had no enlargement and no organic disease did them very badly. So many rheumatic children had an unstable nervous system that these tests were merely picking them out from the remainder.

Dr. E. STOLKIND described his experience of these tests in a military heart hospital in London. In the majority of positive cases the only heart disease present was nervous.

Dr. F. S. SWINEY agreed that the tests were open to fallacy because the system tested was not only the circulatory but also the nervous and the respiratory, and indeed the whole organism, but thought nevertheless that at this stage it would be wrong not to give this promising method of investigation fair consideration and trial. It was important to remember that the closest coöperation must exist between the hospital giving treatment and the rheumatism supervisory centre, and that it was best to examine a few children thoroughly.

Flight-Commander E. D. DICKSON said that these tests, with others, were carried out on aviation candidates for the Royal Air Force, and that great importance was attached to them in passing men for flying.

Dr. HUGH STANNUS said that vasomotor instability was in itself a rheumatic manifestation. It would be very interesting if these children could be watched for a long period to prove whether or not they were rheumatic.

Dr. SLOT, in reply, emphasised that he had never intended the tests to be in themselves diagnostic: they were just one method to be used together with others. The child's parents could not be kept waiting indefinitely, and the doctor had to decide within a short time what kind of life the child was to lead. If he went wrong on these tests, at any rate he went wrong on the side of safety. The tests had been based on a large number of observations and the fallacies had not proved sufficient to warrant real mistrust of them.

Presentation of Cases.

Dr. W. G. WYLLIE presented two cases. The first was a boy of 8 who had fallen from a second storey window four years earlier. Six months after the accident obesity had set in and during the third year he had had frequent frontal headaches, nausea and sometimes vomiting. He was always thirsty but had no polyuria. There was generalised adiposity so that he weighed 81 lb. instead of the 54½ lb. normal for his age. His intelligence was unaffected and there were no abnormalities in the sexual or nervous systems.

The second child, a boy of 6, had fallen while racing upstairs, and in his case, as in the former, fracture of the base of the skull had been suspected at the time. A month or two later his appetite had increased enormously, but without thirst. He would gnaw bones if allowed. He passed 4–6 pints of urine daily, of low specific gravity, but without abnormal constituents. He had fairly frequent frontal headaches but no drowsiness or impairment of intelligence. His nervous system showed no anomalies and his weight and physical development were normal.

Dr. E. A. CROOK showed a case, with skiagrams, of abscess at the lower end of both tibiæ. For a time there had been no leucocytosis, but the temperature had not responded to salicylates. He had only seen one other equally symmetrical case—abscess of the second metatarsal shafts.

Dr. WINNICOTT said the child had first been brought to his clinic as a case of rheumatism, having been taken ill with swelling of the ankles and big-toe joints. When examined a week later his feet had been normal except for enlargement of the ends of the tibiæ.

The CHAIRMAN regarded this as one of those rare cases where the infective focus was really primarily epiphyseal. The difficulty of penetrating the cancellous tissue of the diaphysis had saved the child from a bilateral osteomyelitis.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

A MEETING of this Society took place at the rooms of the Medical Society of London on Feb. 22nd, the chair being occupied by Dr. F. J. H. COUTTS, the President, when a discussion on the diagnosis and treatment of

NON-VENEREAL AFFECTIONS OF THE GENITALIA

was introduced by Dr. H. C. SEMON. He first acknowledged his indebtedness for much of his material to J. Callomon's useful book, and remarked that he would discuss only such conditions as were seen by the dermatologist, and of which he had had personal experience. A number of cutaneous diseases, though not venereal in the ordinary sense, could yet be contracted through sexual intercourse. He set out to deal with them under the following six headings: (1) genital manifestations of the more important dermatoses; (2) pruritus anogenitalis; (3) genital dermato-mycosis and the epizoötic infections; (4) herpes genitalis, molluscum contagiosum, condyloma acuminatum; (5) non-venereal ulcers of the genitalia; (6) certain lymphatic affections.

(1) The delicacy of the epidermis covering the genitalia and the specialised structure of the scrotal skin gave small cause for wonder that the genitals were a common site for many of the *dermatoses which affected the rest of the body*. Of these the commonest was eczema. If this resisted the simple hygienic measures of proper clothing and protection and the application of soothing remedies the thoughts should turn to such possible underlying causes as pediculi, oxyuris, glycosuria, dysentery. The initial pruritus due to pediculi often resulted in severe dermatitis following the use of too powerful parasiticide ointments. The pediculus was easily killed by one or two applications of benzol. In obstinate ano-genital eczema in children the threadworm should be sought, while in stout women the urine should be examined for sugar, and bacteriologically for the colon bacillus. Hæmorrhoids and fissure in ano must not be forgotten as possible causes. A form of chronic dry eczema which favoured the genito-crural region was that termed neurodermatitis chronica circumscripta. Its character was lichenoid, it itched intensely, while owing to the difficulty in securing sleep, it was sometimes the precursor of a serious nervous breakdown. Each type of predisposing cause must be treated in its own proper way. In cases in which the acute symptoms had subsided there was no better "desensitisor" than X rays, but only under expert guidance, as in this region X ray dermatitis was more serious than in any other part. Sometimes psoriasis might involve the scrotum and penis only. Suppuration was rare and itching either slight or entirely absent. It might involve the glans and internal aspects of the prepuce. He emphasised the point that because *B. coli* were plentiful in the urine, or streptococci, these organisms were not necessarily the cause of the disease. After soothing remedies such as resorcin had brought about deturgescence the most efficient treatment was small doses of X rays. Lichen planus also showed a pronounced tendency to affect the mucous membranes, and the genitals might be the selected site. In cases of doubt the buccal mucosa should be examined for the "china-white streaks." The penile lesions in this condition did not ulcerate. Ordinary urticaria did not affect the genitalia alone, but Quincke's œdema was prone to attack the scrotum or one labium majus. The swelling was painless, and the absence of febrile disturbance and glandular swelling should obviate any attempt at surgery. Dr. Semon recommended intravenous injections of afenil (Knoll). Genital eruptions due to taking medicines were not usually recognised as such. They might be scarlatiniform, or morbiliform, or purpuric. The halogen derivatives, quinine in pessaries, and mercury if the patient was sensitive, were occasionally causal. The same drug might show different manifestations in various patients. Two other conditions—namely, erythema exudativum multiforme and pemphigus vulgaris—fairly frequently showed their primary manifestations on the external genitalia. Their onset was insidious and a complaint of pain was not usual. The outlook in erythema multiforme was good when the cause—usually buccal or intestinal sepsis—had been dealt with. Both these diseases had to be diagnosed from impetigo. It was very important to avoid confusion with syphilitic ulceration and cancrum molle.

(2) *Ano-genital Pruritus.*—There were two main categories of sufferers from it: the well-nourished, opulent, middle-aged man of sedentary habits; and the nervous, highly strung woman of temperate habits. The degree of pruritus varied enormously, from slight tickling at odd moments to itching of such intensity and persistence as to lead sometimes to psychical disturbance, occasionally ending in suicide or insanity. There were cases in which the most careful investigation was fruitless, and even X rays or radium failed to give relief. Among the possible contributories to be thought of were blood-sugar abnormality, leukæmia, morphinism, the cocaine habit, digestive disorders, idiosyncrasies to drugs and foodstuffs. No case should be lightly dismissed as hysterical and turned over to the psycho-analyst or to the unqualified radiotherapeutist. There was no standard line of treatment of cases of pruritus; each case must be investigated on the lines indicated. Of those with negative findings a considerable proportion yielded to X ray and radium treatment, and in one case which did not respond to these relief followed the injection, under general anæsthesia, of absolute alcohol.

(3) *Mycotic infections* of the genital area were very common, and should receive primary consideration when an irritating eruption occurred in this region. A cure rapidly followed the use of mild parasiticide ointments. Relapse was common.

Of the *epizoötic infections*, which included pediculi and the acarus of scabies, the latter was chiefly important because it was sometimes possible to diagnose a general infection on the presence of a single acarine burrow on the foreskin.

(4) The presumed ultra-microscopic virus of *herpes genitalis* could certainly be transferred, in the first instance, by coitus. The lesions were small grouped vesicles which ruptured rapidly, leaving small superficial denudations of the delicate epithelium of the glans or the labia, in which secondary infections were apt to occur. It bore no relation to herpes zoster. The lesions of herpes genitalis needed protection with indifferent lotions, powders, and the like, but it seemed impossible at present to prevent recurrences.

Molluscum contagiosum in the genital area did not differ from that elsewhere, and the treatment was surgical. The disease was contagious, had a long latent period, and could be conveyed by towels. Dr. Semon had seen two widespread cases which were contracted in a Turkish bath. *Condyloma acuminatum* affected the mucous membrane in preference to the skin. Favourite sites were the coronal sulcus in the male, and in the female the introitus vaginæ and labia minora. The small vegetating fungoid growths might coalesce and form a pedunculated cauliflower-like mass, in which secondary infection was common. It was conveyed in sexual intercourse, but did not rank as a venereal disease. It was very important to differentiate the cauliflower stage of this condition from fungating malignant growths.

(5) In regard to *non-venereal ulcers* Callomon's classification was useful. The first group were ulcerations following mechanical, chemical, thermal, or electrical influences. It included the ulcers contracted in coitus, the application of caustics to avoid venereal infection, self-inflicted wounds, and occasional accidents after diathermy. An X ray ulcer might be present, and total excision offered the only hope of permanent relief. The second group were the acute infective conditions. The acute tuberculous ulcer

was rare on the genitals; it occurred in cases of genito-urinary infection with quantities of bacilli in the urine. An anal ulcer infected from bacilli-containing fæces might spread forward and involve the posterior vaginal wall. Gangrenous ulcers on the genitals had a complex bacteriology, and the urine should always be examined for sugar. More than once he had cleared up such cases with salvarsan, and subsequently noted in those patients a positive Wassermann.

Discussion.

Dr. H. M. HANSCHELL said that the practitioner in the tropics found that lesions about the genitalia were very numerous. The leishmania sore might make its first appearance on the penis; he had also seen ringworm emerging from the end of a very long prepuce in a negro. A condition which he regarded as a true venereal disease, in that it was acquired in the act of sexual union, was that commonly termed the climatic bubo. It was very rare in temperate regions. The lesions were usually in the sulcus, and if swabbed with a lotion or with spirit there was almost instant healing. No one had yet discovered an organism in affected glands which had been excised and examined. He considered there was a true herpes which occurred round the prepuce and on the glans, distinct from that acquired in sexual union. Soon after the war he saw, in England, a few cases of ulcerating granuloma of the pudenda. The men had acquired the condition during the war; one of the patients had been for 18 months under treatment for chronic intractable syphilis. Meantime the ulceration had spread in each of these men through the abdominal wall into the bladder. Death occurred from exhaustion. The condition had not been described as occurring under the age of puberty, supporting the view that it was a true venereal disease. It began with a hard papule which closely resembled a syphilitic chancre. Early diagnosis was important, as when the lesion was small it could easily be excised. Usually a rapid cure was brought about by intravenous injections of tartar emetic. Elephantiasis of the vulva and penis had been seen in this country also. Cases which arrived in England often went to a surgeon, who proceeded to excise the obvious gland; then he found many deep glands were involved, down to the iliac vessels. All were removed. In two years the patient had elephantiasis of one leg, scrotum, and penis. Climatic bubo had not yet been reported as occurring in the female. It seemed to be connected with the prepuce. It did not occur in people who practised circumcision before puberty.

Dr. T. ANWYL DAVIES spoke of a common form of vaginitis, known as trichomonas. The bacillus did not stain well, and so was not usually detected. He had also seen vaginitis and cervicitis due to scabies.

Dr. F. C. DOBLE said he had seen cases of lichen planus confined to the genitalia, no lesions being seen in the mouth or elsewhere. It was his view that nearly all diseases in the tropics seemed to attack the penis, even leprosy.

Dr. W. S. SHARPE thought that herpes genitalis owned a variety of causes. He had always held there was some local reaction in the cutaneous nerve, or a toxic condition which caused the herpes on the glans. Diphtheroid infections in girls just before puberty caused a vaginal discharge, but never vulvitis or skin condition surrounding the vulva. It could be diagnosed naked eye because the discharge had an opalescent appearance, and did not set up an inflammatory reaction. The vaginal secretion in these cases was always very acid.

Dr. MARGARET RORKE agreed that pruritus ani was one of the most tiresome conditions to treat. Often a small focus of trouble had been missed in the early examination of the case, and then gradually larger areas of skin became involved, and the ultimate cure was very difficult, sometimes only with the aid of X rays.

Dr. DOROTHY LOGAN spoke of a woman who had most intractable pruritus of vulva and anus for 18 months, who was shown to have anal gonorrhœa. There was marked erosion of the cervix and an irritating discharge from that. No gonococci were found, but she had no doubt about the diagnosis.

The PRESIDENT, reviewing the discussion, said he had been struck by the number of the conditions for which X rays seemed to be valuable. It was, however, a means which must be applied with care and by an expert.

Dr. HANSCHELL and Dr. SEMON replied.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF SURGERY.

AT a meeting of this Section on Feb. 8th Sir WILLIAM WHEELER took the chair in the absence of the President, and a paper on

Rectal Narcosis with Avertin

was read by Mr. F. J. MORRIN, who said he had used avertin as an anæsthetic in 54 cases, the oldest patient being 69 and the youngest 3. Excluding four cases in children in which the avertin enema was not retained, anæsthesia was unsatisfactory in only one case, an alcoholic subject. It was light in eight cases—but this did not prevent completion of the operation—and was satisfactory from the operative standpoint in the remainder, though of varying depth. Two cases showed a marked fall of blood pressure, long post-operative sleep, and a weak and rapid pulse which was not restored to normal for four days—symptoms obviously due to overdosage. Thirty-six were cases of advanced carcinoma of the tongue and face, suffering from cachexia, and unsuitable for any other form of anæsthesia. These were cases of what was ordinarily called "inoperable carcinoma," and were treated by diathermic coagulation. Such coagulation of cancerous growths was done with a very powerful diathermy apparatus, and required very deep anæsthesia. The danger of ignition made ether objectionable. Avertin allowed access to the growth and free intraoral manipulation. Mr. Morrin was very favourably impressed with the efficacy of the new drug, and said it was the anæsthetic of choice in toxic goitre. A brief experience with avertin amylene hydrate led him to regard it as a more effective anæsthetic agent, giving better abdominal relaxation and more certain anæsthesia; it was associated with shallow respiration, and was less liable to be attended with a fall of blood pressure. No post-operative bronchitis or pneumonia was observed, despite the fact that many of these aged patients were operated upon for disease of the mouth and pharynx. Care was necessary in preparing the solution accurately, and the dose of 0·1 g. per kg. of body-weight should rarely be exceeded. When it was necessary to increase the dose cautious fractional administration was advisable. Overdosage might possibly occur where the body-weight was decreased by operative removal of a large amount of tissue—e.g., amputation of a limb—in a subject of poor vitality.

The CHAIRMAN remarked that with avertin the patient apparently passed into a somnolent state within ten minutes. This was very different to anæsthesia with oil-ether, the great difficulty about which was the varying time it took to act. An operation under oil-ether could not be timed within three-quarters of an hour, as some patients went under much quicker than others. There was apparently no antidote to avertin, and there was a greater fall in blood pressure than when oil-ether was used. The better administration of avertin was, he thought, a matter of experience. He was interested to note the absence of post-operative symptoms following its use, as after oil-ether patients were sometimes very sick and some developed bronchitis.

Dr. J. BECKETT said that he had always regarded oil-ether as a very satisfactory anæsthetic, and had not found that patients vomited much after it. There seemed to him to be a great deal of complicated technique in giving avertin. The oil-ether method was very simple.

Mr. W. DOOLIN offered his congratulations to Mr. Morrin on being the first surgeon outside Germany to have had an opportunity of testing the new drug. The intention of the German authorities that avertin should not be available for general use until it had been given an exhaustive trial in competent hands was praiseworthy. Opinions in Germany as to its use were very divided. Amongst those using the drug, its method of employment was twofold: it was used either as a basal narcotic, preceded by other narcotic drugs, and with additional ether administration, or else as the sole narcotic medium, and it was in the latter group that most accidents had occurred. To judge from published reports, the difficulties of administration were rather more serious than Mr. Morrin had stated; it has been repeatedly stated that even slight errors of technique might lead to serious effects in patients. The chief dangers were overdosage and overheating; the rapid fall of blood pressure had led to fatal secondary hæmorrhages in a few cases; fatal colonic necrosis had been reported as the result of overheating of the drug before injection. Many observers working with the drug had admitted that the chief disadvantage was the fact that it was impossible to "steer" the anæsthesia so produced. Some had considered that the dosage by body-weight was unsatisfactory; it was impossible to state at any time how much of the drug injected had been absorbed into circulation. Its advantages were enormous when the anæsthesia was successfully performed. The abolition of vomiting during and after operation was beneficial to the patient, particularly so in the case of children. Reports in German literature during the past two years showed a marked falling off of post-operative pulmonary complications. There seemed little doubt that, notwithstanding certain dangers alluded to, avertin was a great step forward in the technique of anæsthesia.

Dr. P. MACCARVILL, who had assisted Mr. Morrin when he started using avertin, said that a 3 per cent. solution had been used, but it had been found difficult to get the powder to dissolve, and later they had used a 2·8 per cent. solution. The fluid was heated first to 45° C., and cooled to 40°. The first time he had given avertin he had been rather alarmed, as the patient's blood pressure fell and the breathing became very shallow; but the operation was quite successful. Avertin seemed to him to some extent a phasic anæsthetic; at one time the patient appeared to be very deeply anæsthetised and at another not so deeply. When administered with care he regarded it as invaluable.

Mr. A. A. MCCONNELL said that so far nothing like an ideal anæsthetic was known, and a good many of the objections to avertin applied also to ether. He referred to the possibility of using diathermy in the mouth when rectal ether was being employed, and said that he had been doing this for years without encountering any difficulty.

Mr. MORRIN, in reply, said he had tried rectal oil-ether extensively, and thought that there was no comparison between the two anæsthetics. There were many dangers from oil-ether also. There was no great technical difficulty in preparing avertin. The mortality following its use had occurred in the early stages when too big doses were given, and when it was used in cases of hepatic and renal disease. Where the blood pressure fell very low he had found that ephedrine controlled the fall. He had never seen a case of secondary hæmorrhage after avertin anæsthesia.

Mr. R. A. STONEY read notes on a case of cholecystocho-duodenostomy, and a discussion followed.

Dr. HORACE LAW showed a steel pin which he had removed from the bronchus of a child of 7.

Reviews and Notices of Books.

CYTOARCHITECTONICS OF THE HUMAN CEREBRAL CORTEX.

By CONSTANTIN VON ECONOMO, Professor of Neurology and Psychiatry, University of Vienna. Translated by Dr. S. PARKER. London: Humphrey Milford, Oxford University Press. 1929. Pp. 186. 21*s*.

"The Cytoarchitectonics of the Human Cerebral Cortex" is a translation, not, as one would infer from its title, of Economo's monumental work, "Die Cytoarchitektonik der Hirnrinde," but of his smaller and later book, not specifically mentioned in any place in this volume, "Zellaufbau der Grosshirnrinde." This is not made clear on the title-page. The smaller book received immediate recognition at the time of its first publication in the German two years ago, and it has already been translated into several languages. The first translation, the French version by Dr. Ludo van Bogaert, set a very high standard. A master both of cerebral anatomy and of the art of lucid writing, Dr. van Bogaert reproduced every refinement of the meaning of the original, and rendered this intricate subject more easy to follow by the clarity of his expression and by the explanatory heading with which he preceded each section. The result is a book which may become a French medical classic. Nothing comparable can be said of the English version. In the first few chapters, which are the most difficult part of the book to understand, there are passages so obscure that we have been able to discover their meaning only by reference to the original. The later chapters, consisting of more straightforward descriptions, are less difficult to follow, but the translation will not completely satisfy those English readers who are not in a position to turn to the original work.

Prof. Economo undertook anew the work that had been done by Brodmann, Campbell, and others, examining in detail the cellular structure of every part of the cerebral cortex. The great value of his work, apart from confirmation of earlier findings, is that it brings into the mass of detail an orderliness which simplifies the whole subject. While the six fundamental layers can be recognised in the cortex of practically every part of the brain, they vary from place to place to such a degree that essential similarities may not be recognised; Economo shows that three characteristic formations—the frontal, parietal, and temporal types, with slight modifications within their respective areas—cover a large fraction of the brain surface; two other types, the one abounding particularly in granule cells, the other in pyramidal cells, compose the rest of the neo-pallium. In general, cortex of receptive function is "granulous," and cortex of effective function is "pyramidal" or "agranular." The rhinencephalon and its adjuncts have, as is to be expected from its development, a very different structure.

The study of structure is one of the methods by which we shall gradually enlarge our knowledge of the localisation and integration of function in the brain, and Economo's work is a great contribution to neuro-anatomy. In this volume there are numerous illustrations, most of which are photographs in which detail is essential, and they are all well reproduced. The text teems with technical terms and we have found no misprints.

PHYSICS FOR MEDICAL STUDENTS.

By SIDNEY RUSS, D.Sc., F.Inst.P., Joel Professor of Physics to the Middlesex Hospital Medical School; Physicist to the Middlesex Hospital; Fellow of University College; Fellow of the Royal Society of Medicine. Edinburgh: E. and S. Livingstone. 1928. Pp. 230. 10*s*. 6*d*.

THERE exist already a large number of elementary books, which set out to help the student through

his preliminary studies in physics. There is ample justification, however, for the production of another by an experienced teacher who is inspired with a desire to interest medical students in a subject which is becoming increasingly important as a grounding for the later subjects of their curriculum. Throughout this new text-book is a medical bias; without dragging in so-called "medical applications," Prof. Russ illustrates his topics in a natural way by means of examples drawn from medicine. The student, who is often disposed to regard his year of instruction on the basic sciences with impatience, will appreciate this method of helping him to grasp the bearings of physics on his chosen life-work.

An unusual feature is the policy of omitting examples other than those in the body of the text. Zealous students will refer to special books and to papers set in previous examinations to make up for this defect; the less enterprising ones may welcome the omission of exercises usually included at the end of each chapter in elementary text-books of physics, and decide that it is unnecessary to test their knowledge. However, since the majority of the readers of the book will be attending lectures and practical classes in physics, it can be assumed that a suitable selection of numerical and other problems will be supplied by their teachers.

The work is well produced, is attractively printed, and has a good supply of clearly drawn diagrams, which, with the exception perhaps of Figs. 71 and 73, greatly assist the author in his concise exposition. Figs. 71 and 73 show the passage of light through a prism, in which dispersion takes place at one surface only; and the emergent violet beams seem to have become divergent.

The student will welcome a book which does not assume that, at the moment, he desires to study physics far beyond the requirements of his syllabus. The teacher will appreciate the fact that though the work is concise, it is not a mere cram book. The chapter on radioactivity and X rays is notable as one of the best summaries of our present knowledge that we have seen; in itself it would justify publication of the book.

PHOTOGRAPHS OF THE FUNDUS OCULI.

A Photographic Study of Normal and Pathological Changes Seen with the Ophthalmoscope. By ARTHUR J. BEDELL, M.D., Member of the American Ophthalmological Society. Philadelphia: F. A. Davis Company; England: Stanley Phillips, Billericay, Essex. 1929. An atlas containing 95 plates, 324 single pictures, and 272 stereoscopic photographs. Pp. 317. £5 5*s*.

To most ophthalmologists the contents of this book will come as a revelation. Hitherto, in order to preserve an impression of a fundus, we have had to rely on hand drawings, in pencil or water colour, which involve technical skill and a fatiguing ordeal for the artist who has to display patience. It is true that the result is often excellent, but the necessary expense and trouble involved render it hopeless to expect that this method should be made applicable to a large number of cases. Moreover, some of these pictures succeed better in emphasising the points that the surgeon desires to have emphasised than in conveying a strictly true objective representation of the facts. In this volume, on the other hand, we have a vast number of actual photographs of fundi which show clearly and without the possibility of bias the appearances as revealed by the ophthalmoscope. There are only two drawbacks. These pictures, being photographs, are in black and white, the various shades of red, white, and yellow actually seen with the ophthalmoscope being represented merely by varying shades. The other drawback is an unavoidable reflex of the carbon source of light (the pictures are taken with the carbon-arc lamp) which appears in the centre of the plate—in these pictures generally between the disc and macula. This volume, the first of its kind in English, contains a selection from 4000 photographs made with the Nordenson camera of Zeiss. The author acknowledges his debt to previous workers in the same field, and especially to F. Dimmer and to J. W. Nordenson, of Stockholm, the latter of whom demonstrated the method at the International Congress of Ophthalmology held in Washington in 1922. The photographs show a big assortment of varieties of normal and diseased fundi, and since a large proportion of them are stereoscopic it is possible to obtain a sense of relief that makes them in this respect even superior to the view ordinarily obtained with the ophthalmoscope. There is a foreword of 33 pages which explains the principles on which the collection of photographs is arranged, and to each photograph is appended a brief note of the case from which it was taken and the chief points which it is designed to illustrate. In some cases there is more in the description than can easily be made out in the photograph.

The foreword has been compiled without sufficient care, since in several instances the references to particular figures in the text are wrong. The errors should be corrected in a second edition.

FROM CLOUD TO SUNSHINE.

By ALFRED S. GUBB, M.D. London: Baillière, Tindall, and Cox. 1928. Pp. 128. 3*s*. 6*d*.

Dr. Gubb's volume on Algiers and Algeria as a Winter Resort is now in the eleventh edition, which proves it to be a useful guide to the physician and also to a wider circle of readers. In addition to information about the climate and the facilities for travel and recreation, the historical, archæological, and geographical descriptions are of general interest. The book contains a useful map, and practically every page is illustrated.

JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE, January 1929. The fate of old employees is discussed by W. I. Clark, who investigated the conditions of workers aged 65 years and over and of pensioners connected with a large factory. He concludes that, while pensions are necessary, they are unsatisfactory, and that by means of medical supervision and careful placement older workers may be advantageously kept at work. He found that the physical condition of workers aged 65 years and over varied little from year to year. Work is always more pleasurable than a pension.—An effort is made by C. O. Sappington to evaluate physical defects found at medical examinations. He adopts a grading scheme for assigning a numerical value to physical defects. On this basis he found that those applying for industrial work had scores with a mode at 85, as compared with a mode of 95 for university men. This is supposed to demonstrate that physical and mental make-up are closely correlated.—The physiology of industrial fatigue is effectively portrayed by R. J. S. McDowall. The subject is shortly and clearly set out so that it may be easily grasped.—The longest and most important article in this number of the journal is contributed by H. W. Armit on the development of industrial hygiene in Australia. Some account is given of the growth of industry in that continent, and of the relation between trade-unions and health conditions. The Commonwealth itself has established a Division of Industrial Hygiene for assisting to solve problems which may arise in the various States. Some report is given of investigations already carried out by the staff relating to the occurrence of dust diseases and lead poisoning. Though employers are still slow to grasp the value of the new science of industrial hygiene, which creates a spirit of willingness in the workers, Australia has made a good start on a sure foundation.

THE LANCET.

LONDON: SATURDAY, MARCH 2, 1929.

THE PREVENTION OF INFLUENZA.

THE virus of influenza is usually, if not always, transmitted by the droplets that are sprayed into the air with every expiration of an infected person. Strict isolation should therefore be an effective means of preventing the spread of the disease, and it is well to consider how far it has proved useful. In 1918 an attempt was made to prevent infection getting into Australia from the many heavily infected ships lying in harbour there. Enforcement of strict quarantine regulations achieved this object for three months, and the measures taken were thought so satisfactory that when influenza did at last break out in the Commonwealth the suggestion was made in all seriousness that it was due to an endemic virus rather than to a breakdown of quarantine. S. MONCKTON COPEMAN has reported the case of a school near Cambridge which remained free from infection during the whole of the autumn term of 1918. This was attributed to the pupils being forbidden to enter the town, where influenza was prevalent, and when the embargo was removed in the following term three-quarters of them contracted influenza within a fortnight of infection being introduced. Many instances also have been reported in which individuals and families have eschewed all contact with the world outside their houses and have thus escaped attack. Such examples illustrate the conditions under which rigid isolation is likely to be successful, but they serve at the same time to emphasise its limitations in practice. Once an influenza epidemic has broken out, the isolation of all infectious cases from the rest of the population—in contradistinction to isolation of the fit from the infected—is impracticable if not impossible. There are instances, it is true, in which isolation of patients is said to have checked an epidemic; thus H. JENSEN, in 1918, on an island of 750 inhabitants, isolated the first (and only) 12 cases of an influenza outbreak and enforced the wearing of masks and overalls on all who attended them. But there is no evidence that in large communities the notification and isolation of patients has had any appreciable effect on the total incidence of influenza. In many epidemics a large proportion of cases, perhaps sometimes more than half, are so mild that the sufferers are able to continue their usual avocations. Again, although the causal organism of influenza has not been identified and therefore the existence of carriers is hypothetical, it is probable that healthy distributors of the virus play a part in spreading infection. For these reasons notification and isolation of cases, even if machinery were available, would be unlikely to affect the general morbidity appreciably. Under the rather exceptional conditions of ship life J. H. L. CUMPSTON found that taking the temperature of the whole ship's company daily, with prompt removal of all who felt ill or who had any fever, did not prevent attack rates ranging from 30 to 89 per cent. Even when allowance is made for the close contact of those on board ship, it is hardly conceivable, in face of the failure of this routine, that any measures for the discovery and segregation of infected individuals which could be enforced in a big city would do much to lessen the incidence of epidemic influenza.

The value of vaccine prophylaxis in influenza from the first seems very doubtful, for even an actual attack of the disease apparently confers only a feeble and fleeting immunity. Admittedly the statisticians responsible for the Ministry of Health report on the 1918 pandemic came to the conclusion that "a naturally acquired immunity is often a valuable safeguard," but they could find no significant statistical evidence that the vaccines in use before the time of writing (1920) were in any way protective. Grave difficulties stand in the way of collecting reliable data on the efficacy of such prophylaxis, and even were it possible to prove that at a certain time and place one antigen was useful, there is no knowing whether it would be a success in the next epidemic or the next town. Owing to the extraordinary variability of the clinical picture and morbidity of influenza at different times and places, one must look with suspicion on the claims of those who hold that a vaccine has proved itself effective because it seems to have modified the severity of an attack. It is natural that clinicians with the acute pulmonary infections of 1918–19 still in mind should be inclined to attribute the mildness of their cases nowadays to better treatment or to prophylactic inoculation. The *post hoc ergo propter hoc* argument dies hard in medicine, and a good instance of its fallaciousness given by E. D. JORDAN relates to this very disease. In a group of 234 men, 101 got influenza within a few days, and it was at once decided to inoculate the remainder. For some reason this was not done; yet only one further case developed. If the vaccine had been used it would have been only too easy to convince the majority of medical men that the course of the epidemic had been, to some extent at any rate, influenced by active immunisation. In considering this difficult subject we must remember, too, that if inoculation is followed by an increase in morbidity it does not necessarily mean that the antigen is useless, for the incidence of the disease might have been still greater if it had not been employed. Even should vaccines do nothing to prevent attacks, they may sometimes limit the duration, severity, and complications of the disease, and hence it is reasonable that people should be given the chance of taking or refusing prophylactic inoculation after they have been warned that nothing is known for certain about its efficacy. The absence of any consensus of opinion on the value of vaccines prevents the profession from commending inoculation to the general public, but an efficient prophylactic would be such a boon, especially in schools and the public services, that every effort should be made in suitable places to continue the administration of influenza and catarrh vaccines under controlled conditions which will make it possible to judge their value fairly.

The question whether schools and places of entertainment should be closed during an epidemic is also unsettled. Influenza is so infectious that closure of day schools possibly has little effect on its incidence, since the disease is likely to be contracted by children

playing together in the streets or in their homes. On the other hand, where pupils sleep together in dormitories there is sometimes a very high attack rate and a serious type of case; and this makes it seem inadvisable for residential schools to reassemble, if an influenza epidemic has broken out during the holidays, until infection has subsided. Should such an epidemic manifest itself in term time, it may be possible, as COPEMAN'S report suggests, to prevent access of the virus to the school; but if quarantine should break down it appears unwise to spread the local strain of influenza abroad by disbanding the children to their homes. To close places of amusement is a theoretically sound policy, but probably has little effect on total incidence; it is, therefore, as a rule, uncalled for save in malignant epidemics which are so serious that the public will cheerfully accept restrictions of this kind. The general use of masks has been tried in America but was not a success; their inconvenience and disfigurement outweighed any obvious advantage. For all that, an efficient mask intelligently used is an excellent defence against droplet infection, and eight layers of surgical gauze will hold up all infective material. They have an undoubted value for those who have to attend or visit patients with serious and complicated influenza, but they must be used sensibly and must be frequently sterilised, for if their outer surface gets contaminated and they are put on back to front they become a danger rather than a safeguard. A German writer has lately advised plugging the nostrils with wool, but this would rather increase than diminish the risk of infection, for it would encourage mouth-breathing and thus lower the vitality of the nasal mucosa. Most authorities agree that wholesale administration of drugs such as quinine, iodine, and mercurials cannot do any good, even if it does no actual harm, and there is a growing disposition to include gargles and nasal douches in the same category. Failing any such measures of proved practical utility, the central health authorities have had to fall back on asking the public to obey the ordinary rules of personal hygiene, hoping that by this means individuals will to some extent be able to protect themselves. Though most people who have to work cannot avoid crowds and shun the company of all who have coughs and colds, they can usually diminish the number of such contacts; they can refuse to go to places of amusement and to fulfil social engagements, and they can avoid paying unnecessary visits to sick friends. Over-fatigue and malnutrition almost certainly predispose to infection. It is true that R. A. SPAETH found that exhausted rats, provided they were allowed to feed, were no more susceptible to inoculated infection than controls, but A. E. BOYCOTT and C. PRICE-JONES, while confirming SPAETH'S observations, showed that if the infective material was administered in the food instead of hypodermically, the fatigued rats died where the controls survived, which is more in harmony with clinical experience. Despite the fact that epidemic influenza occurs as readily in the tropics as in cold climates, all practical experience points to the danger of chill and undue exposure to cold, especially in association with exhaustion. To avoid these—though not at the expense of ventilation—is therefore sound policy, and will do something to prevent dangerous pulmonary complications.

There is little reason to suppose that any practical measures have much effect on the total morbidity of an influenza epidemic; avoidance of close and frequent contact with infectious foci probably tends rather to prolong the outbreak than appreciably to diminish the total number of persons attacked. Bu even in the most crowded institutions the attac rate rarely approaches 100 per cent., and some peopl manage to avoid all symptoms, although constantly exposed to infection. This observation suggests tha escape from the disease is seldom due to escaping al contact with infection, and we are obliged to believ that those who pass through epidemics unscathe do so because they have acquired some degree o immunity. Such reasoning leads to the fatalisti conclusion that a person must either be immune t the local virus or ultimately succumb to influenza and on this it may be argued that it is useless to tak precautions, so why not seek infection and get i over? The reports of COPEMAN and CUMPSTON already quoted, somewhat favour such an attitude for in both cases a community was submitted to muc inconvenience and escaped for a time, only to suffe in the long run like everyone else. Indeed, if it wer certain that the size of the infecting dose of virus or the period over which it is given, made no differenc to the result, and if we were sure that escape from a attack, or the type of illness, was only determined b the innate resistance of the individual, then the advic not to trouble about avoiding infection might b sound; if all epidemics of influenza behaved like th pandemic of 1918 the immunity conferred by an earl attack, even if only slight and transitory, might giv protection against the severe pulmonary infections t be expected in the later epidemic waves. But we hav good reason to believe that catching the disease, an its severity when caught, depend to some extent o the dose of infective material. Therefore if peopl take all the precautions to avoid infection that ar consistent with their mode of life, although they ma not succeed in escaping an attack of influenza, thei illness will probably be milder. Moreover, if there i any truth in the theory that a temporary immunit can be acquired by the inhalation of subinfectiv doses of the virus, it is conceivable that those wh take as much care as they can to avoid infection an keep themselves fit will gain an amount of immunit which, even if it does not carry them through th epidemic, will moderate the intensity of thei symptoms if they finally succumb.

Influenza is usually a trivial disease, and only minority of patients suffer from dangerous pulmonar complications or have a really severe illness wit unpleasant sequelæ. But owing to the high gener attack rate and the clinical characters of speci outbreaks, such serious cases may at any tim become numerous. Whilst it may be impossible t do much to lower the total incidence, conformance t the common-sense rules of health and behaviour lai down by the Ministry of Health may well do somethin to reduce the severity and mortality of the diseas by preventing massive doses of infection and by keepin the body in a fit state for combating infection once is established. In conclusion, we may say that th victim of influenza who does not go straight to be is both fool and knave. He is a knave because h goes on spreading infection among his associate and a fool because he is risking a long illness with i resultant loss of time and money, or even deat instead of submitting to a day or two's discomfort i bed. Everyone who had any clinical experience o the 1918 influenza must have seen many tragedie in which a strong man, from a mistaken sense of dut kept going at his work in spite of fever, only collapse later and die of broncho-pneumonia within few days. Fortunately, the present epidemic is le virulent, but the lesson is still applicable and i wisdom is proved by error every day.

WASSERMANN v. VERNES TEST.

THE Wassermann reaction is constantly being quoted in controversies as to the application of scientific discoveries to medical practice, and may be used with deadly effect by either side. For while it is common knowledge that the theoretical ladder on which the test rose to fame has long been discarded as unsound, the practical utility of the reaction to determine whether a patient has had syphilis in an active or latent form is unquestioned. In fact those who habitually work with this test in a laboratory are often dismayed at the unbounded confidence placed in their findings, since the test is complex and difficult to carry out and its reliability depends on other factors besides the experience and judgment of the pathologist. Even when the test is made in laboratories where routine procedures are most carefully standardised under the direct personal supervision of an expert, the reaction given by a patient not actually undergoing treatment may vary in an unaccountable manner; one week the reaction may be a strong positive, and the next it may be found weakly positive, or perhaps even negative. This may, of course, be due to alternations of the reaction in the patient himself, but other explanations may be given, as has been brought out recently by JOHN A. KOLMER.[1] He mentions, for example, that the composition of the distilled water used may effect the test; traces of magnesium salts are necessary for the reaction, and in certain localities it may even be desirable to use sterilised tap water in preference to distilled water. So apparently trivial a matter as the addition of amboceptor and corpuscles separately, or simultaneously in the form of sensitised corpuscles, also makes a difference. Dr. F. GRIFFITH and Dr. W. M. SCOTT showed in 1920[2] that there is no constant relation between hæmolytic activity and fixability, and, moreover, that the behaviour of a complement towards antigen alone is no indication of what will happen when it is brought into contact with the serum-antigen complex. Further experience in the technique of this test has not disposed of these uncertain factors. Moreover, much discussion has raged over the properties of different antigens. Some workers prefer plain extracts, others fortify these with cholesterin, others again remove the acetone-soluble fraction of plain extracts, and yet others use only the acetone-soluble fraction. Two years ago a series of comparative tests were performed by pathologists working in different laboratories, all of whom used substantially the same technique. The results differed by as much as per cent.

The inference from all available evidence is that the Wassermann test is so complicated as to require the undivided attention of a specialist who must carefully watch each phase of the control standardisation of the ingredients and each stage of the test. This work is almost too tedious to be expected from a hospital pathologist who has any other duties to perform. It is clear that if a simpler method than the Wassermann reaction could be evolved which was less reliable, it would be a boon to laboratory workers. The flocculation tests, which require fewer reagents, are still on trial. The latest of these to attract attention is the Vernes test, of which Dr. ANSEY BAYLY gives an account on p. 434 of our present issue. In this test the readings are made quantitatively, with an optical instrument of considerable delicacy. At the Technical Conference on Serum Tests for Syphilis, held at Copenhagen in May, 1928, under the auspices of the Health Committee of the League of Nations, where reports on the merits of the different tests employed were considered, the Vernes test was included for the first time in formal international discussion. The report of the proceedings of this conference is likely to be published shortly, and the verdict on the Vernes test will be awaited with interest. One advantage of this test is its long range of possible readings which, if they could be correlated with the clinical condition of the patient, would give a delicate estimate of progress. It is true that the exact relation of the degree of strength of the Wassermann positive readings to the severity of infection is unknown. But in practice a strongly positive reaction is regarded as an indication that the patient is not reacting to treatment, and the aim of the doctor in charge of the case is not only to ameliorate the patient's clinical condition, but also to render the Wassermann reaction permanently negative. The longer range on the Vernes scale might make it easier to correlate clinical condition with laboratory findings. The Vernes apparatus is now in use in France, Spain, Italy, Belgium, U.S.A., and South America. In this country it is being tried out at St. Mary's Hospital, at the Hospital for Sick Children, Great Ormond-street, and at St. John's Hospital, Lewisham, as well as by individual pathologists in their own laboratories. The fact that the antigen is issued from a central source reduces the number of variables to be contended with, and will facilitate the comparative investigation of the test. It is not necessary to prove that this test is more delicate than the Wassermann reaction to secure its widespread use. If it turns out to be no less sensitive and trustworthy it will be adopted with enthusiasm.

[1] Serum Diagnosis by Complement Fixation. Philadelphia, and Febiger, 1928.

[2] The Technique of the Wassermann Reaction. Ministry of Health Reports on Public Health and Medical Subjects, No. 1.

THE TENURE OF POSTS UNDER LOCAL AUTHORITIES.

Do the medical officers of health of urban district councils realise that they can be dismissed at a moment's notice? This startling position is established by the decision of Mr. Justice McCardie in Brown v. Dagenham U.D.C., a case of which the hearing began on Jan. 23rd and in which judgment was not given till Feb. 22nd. Mr. W. H. Brown held the posts of superintendent-assistant overseer and clerk to the council. He claimed damages for alleged wrongful dismissal, complaining that he had been the victim of a conspiracy by certain Socialist members of the council who could not forgive him because he had stood for law and order during the General Strike in 1926. The council's defence was that Mr. Brown had resigned from the clerkship and had been dismissed from the assistant overseership for neglect of duty and inefficiency. The judge found that Mr. Brown did not resign from his clerkship, but that the defendant council had a right to dismiss him at will from both posts.

On the case first coming on, the judge tried to induce the parties to settle the matter; when it nevertheless proceeded, and defendant's counsel argued that the local authority had power to revoke any appointment without notice, the judge observed that, if this were correct, "every town clerk, however eminent, every medical officer of health, however distinguished, and every treasurer could be ignominiously dismissed to-morrow without notice." The judgment has now confirmed the correctness of this

contention. What made Mr. Brown's case particularly hard was that he held his appointment under a minute of the defendant council stating that it was "subject to three months' notice on either side." There was no written contract otherwise between the parties, but a local government official would hardly expect a local authority to repudiate its own minute. Mr. Justice McCardie's decision means that the minute was ultra vires and worthless. Section 189 of the Public Health Act, 1875 (under which Mr. Brown was appointed as clerk) says: "Every such officer and servant appointed under this Act shall be removable by the urban authority *at their pleasure.*" This gives the local authority a power of dismissal similar to that possessed by the Crown, a power which cannot be negatived or impaired by any contract of service. Mr. Brown's appointment as assistant overseer rested on Section 5 (1) of the Local Government Act of 1894; this enactment does not contain the despotic phrase "at their pleasure," but the power of revoking an appointment is in the widest terms. The judge has held that an appointment under the 1894 Act can be as summarily terminated as one under the 1875 Act; Mr. Brown could be dismissed at any time without cause given and without notice. The result was that his claim for wrongful dismissal failed.

The questions of fact—whether he resigned or was dismissed, and whether he was guilty of misconduct or not—were heavily disputed. At various points the judge seems to have taken the view that Mr. Brown was right and the council wrong. After the date of the purported resignation the council gave him three weeks' leave, but omitted to pay him the three weeks' salary. This latter sum he has been awarded by the court; it had been paid into court with a denial of liability; the judge says it would have been more proper and generous if there had been an admission of liability. Mr. Justice McCardie has further stated that Mr. Brown's dismissal was not only harsh but also unjustifiable, and that the charge of misconduct was "very unfortunate both in its wording and its object." The judge, however, could not say that the council had acted dishonestly nor did he find himself entitled to substitute his own opinion for the council's almost unanimous view. In making these criticisms he went perhaps somewhat out of his way, since his decision that the council possessed an arbitrary power of summary dismissal was the turning-point in the case. The criticisms are noteworthy as a reminder that the officer of a local authority cannot always rely upon fair and generous treatment, but may find himself exposed to unexpected antagonisms when the political atmosphere is heated. The judge's order that both sides should pay their own costs doubtless marks his view of the merits and equities of the successful defence. Meanwhile medical officers of health, who are in exactly the same precarious position as Mr. Brown, can hardly be content with their defencelessness. The critical words "at their pleasure" in Section 189 of the 1875 Act seem, by virtue of Section 190, to be applicable to the medical officers of health of rural as well as urban authorities. The position of county medical officers of health is different, since by Section 68 of the Housing, Town Planning, &c., Act, 1909, county councils can remove them only with the consent of the Minister of Health and not otherwise. In a county borough, where any portion of the salary of the medical officer was paid out of moneys voted by Parliament before it was constituted a county borough, the whole-time medical officer has a safeguard under Section 1 of the Public Health (Officers) Act, 1921. He is removable by the authority only with the consent of the Minister, or else by the Minister himself, and not otherwise. If the legal decision in Brown *v.* Dagenham U.D.C. stands, the insecurity of non-county medical officers will certainly be for Parliament to rectify. Is any step being taken in the Local Government Bill to secure the tenure of all medical officers in terms which are clear and universal?

Annotations.

"Ne quid nimis."

THE ROYAL SOCIETY.

THE Council of the Royal Society, at a meeting on Thursday, Feb. 21st, recommended 15 candidates for election into the Society, among whom several have done work directly or indirectly connected with medicine. The election of Dr. Frederick William Twort, superintendent of the Brown Animal Institution, will be regarded widely as a fitting recognition of his long career of research in the course of which his name has been identified, but not over generously, with a pathological discovery of high importance. Dr. John Mellanby, professor of physiology in the University of London, is known for his studies on digestive enzymes and hormones. Dr. Henry Stanley Raper, professor of physiology in the University of Manchester and director of the Physiological Laboratories, has to his credit a quarter of a century's successful labour in the laboratory and as teacher at universities in this country and in Canada. Other new Fellows who have contributed to the advance of medicine are Dr. James Gray, a Fellow of King's College, Cambridge, and lecturer in comparative anatomy in that University; Prof. Harold Roper Robinson, professor of physics in the University of Wales; Mr. Charles Drummond Ellis, University lecturer in physics at the University of Cambridge; Prof. A. J. Allmand, professor of physical and inorganic chemistry at King's College, London; and Prof. A. H. R. Buller, professor of botany in the University of Manitoba.

REFLEX MUSCLE ATROPHY.

THE cause of the muscular wasting associated with arthritis has been much discussed, but the various theories propounded to explain it cannot be said to have a firm basis in physiology or pathology. We publish in this issue the report of an investigation by Dr. Beryl Harding which seems to be a substantial contribution to the solution of the problem. In a previous communication she described an important difference between the metabolic activity of muscle which had wasted as a result of arthritis and that of those in which the wasting was secondary to disuse. The former were found to show a great increase in oxygen consumption, which was almost double that of the latter and of normal muscles. This led to the hypothesis that the affected muscles might be in a state of reflex stimulation produced by impulses arising in the painful joints, and Dr. Harding's latest investigation has confirmed this explanation. Her physiological research throws light upon certain clinical facts concerning this type of muscular wasting. For example, it is a familiar observation that the tendon reflexes are increased in muscles whose wasting is attributable to arthritis; and this is clinical indication of reflex hypertonia. R. K. Lippman and S. Selig,[1] whose experimental study of muscle atrophy Dr. Harding quotes in her paper, object to her explanation of the increased oxygen consumption of the wasted muscles, on the ground that such heightened metabolism may occur in any spastic muscle, regardless of its diminution in size. But it is a well-known physiological fact that the metabolism of the spastic muscles of decerebrate rigidity is greatly below that of normal muscles. Clearly the reflex activity of the wasted muscles in arthritis is extremely expensive of energy and is physiologically different from the reflex postural hypertonia which results when certain levels of the nervous system escape from higher control. Clinical observation suggests that reflex muscle wasting is a concomitant also of lesions other than arthritis. It is to be found, for example, in association with metastatic neoplasms

[1] Surg., Gynecol., and Obst., 1928, xlvii., 512.

one. The most familiar manifestation of such asting, however, is as the product of chronic pul-ionary disease, especially tuberculosis. Unilateral asting of the pectorals, trapezius, supraspinatus, homboids, levator anguli scapulæ, and even of the ongue is almost constantly to be found in the resence of tuberculosis of the upper lobe. This asting, like that due to arthritis, is associated, at ast in the early stages, with heightened reflex ctivity, manifested as myotatic irritability. It is herefore probable that arthritic muscular atrophy is special instance of a general tendency to the ccurrence of heightened reflex muscular activity in he neighbourhood of a visceral lesion. Such a eflex may well be protective in purpose, if we may peak teleologically, but its production by pulmonary isease which is often painless indicates that it is not xclusively associated with lesions causing pain.

PARASITE v. HOST.

In the interplay between an animal or plant and s parasites there is always a tendency for selection o produce a race of hosts which can more or less uccessfully resist the parasite and a race of parasites hich can effectively evade the host's defence. As the ost population becomes more immune so the parasite opulation is apt to become more virulent. A articularly clear example of this adaptation in a arasite has lately been published [1] by Mr. W. A. R. illon Weston from the School of Agriculture at ambridge. The Sherman variety of wheat is highly sistant to the fungus (*Tilletia caries*) known as bunt"; thoroughly contaminated with bunt from ittle Joss wheat, which is susceptible, it produces crop with 1 or 2 per cent. of diseased ears. If this herman bunt is used to contaminate Sherman seed the next crop the rate of infection rises to 86 per ent. Another resistant variety, Berkeley Rock, was ontaminated in 1927 with Little Joss bunt and roduced 1·6 per cent. of bunted ears; in 1928 ontaminated with its own bunt this was increased to 1·1 per cent. The discovery or production of immune arieties has protected many crop plants from estructive diseases, but the parasites are evidently ying all the while to circumvent the plant breeder. he villainous mycologist evidently has a weapon ore effective than tares.

LEUCOCYTIC CHANGES DURING LIVER THERAPY.

The effects of the Minot-Murphy method of treating ernicious anæmia on the red blood cells, the hæmo-obin-index, and the blood nitrogen have been udied by various observers, but with the exception L. E. H. Whitby,[2] no one seems to have made a rticular study of the changes in the white blood rpuscles. Dr. G. Giauni, of the University of noa, has lately published some observations [3] ich fill this gap in our knowledge. He found that e leucopenia invariably present in pernicious anæmia uld be divided into three groups: (*a*) Cases with ense medullary reaction, representing about per cent. They are characterised by a marked cocytosis produced by the liver treatment and ri passu with this increase in the white cells there an increase in the red cells. Poulton and Langmead ve described a colour-index above normal. (*b*) ses with adequate medullary reaction, comprising out 55 per cent. in which the number of leucocytes urn to the normal amount; in some cases the mber of the cells may be slightly below normal, others slightly surpassed, but not to the same ent as in the first group. (*c*) Unfavourable cases h slight or absent medullary reaction. In about per cent. of the cases there is little or no response a prolonged ingestion of liver, the red cell increase is very small, and pari passu the number of white cells undergoes a very slight increase; the leucopenia remains and is of unfavourable prognosis. As regards qualitative changes, the hepatic treatment influences the behaviour of the neutrophiles. In the majority of cases (75 per cent.) the polymorphs increase in number without going beyond the normal. The increase in granulocytes corresponds to the total increase in leucocytes. In rare cases after treatment no variations are observed; the total mass of leucocytes increases very little and usually only reaches a figure below normal. There are still rarer cases where the number of neutrophiles is at the end of treatment below what it was at the beginning. As regards eosinophilia, which has been noted by Whitby, Dr. Giauni met with only one instance of slight increase (3 per cent.) in all his cases. The increase in polynuclears, whether they be neutrophiles, basophiles, or eosinophiles, seems to indicate that the erythropoietic activity of the bone-marrow is at the time actually increased, even though there are marked qualitative changes in the leucocytic formula. There was no change of any importance noticed in the basophiles nor in the monocytes. In pernicious anæmia there is a relative lymphocytosis, and this is only natural since, according to Ceconi, the lymphatic tissue continues to function normally, and given this relative lymphocytosis it is natural that with the increase of granular neutrophiles the number of lymphocytes should diminish. Generally the reduction in the number of lymphocytes is directly proportional to the increase in neutrophiles; the more the former increase the more the latter diminish. Assuming, in the absence of evidence to the contrary, that in pernicious anæmia the lymphatic system functions normally, it may be concluded that the behaviour of the lymphocytes is directly dependent upon the behaviour of the polymorphs, whether they be neutrophiles or eosinophiles, and that these reflect the greater or lesser activity of the bone-marrow.

[1] Nature, Feb. 16th, 1929, p. 243.
[2] THE LANCET, 1928, i., 285.
[3] Policlinico, Practical Section, 1928, xxxv., 2083.

A PIONEER IN SEXUAL PSYCHOLOGY.

It is a truism that the moral and intellectual outlook of mankind varies with time and place, but only occasionally does some event draw our attention to changes that, without notable landmark, have occurred within our own days. Such an event is the publication of a biography of Havelock Ellis, by Houston Peterson.[1] The young Havelock Ellis is pictured as a studious, introverted, and conscientious youth, whose inner difficulties were greater than those of a similarly constituted youth of to-day, for the mystery of sex was then so well guarded that, as the biographer points out, Huxley's "Textbook of Physiology" went through many editions without a chapter on reproduction. These difficulties prompted in him the resolve to explore the dangerous ocean of sex in order to save other young people from the perplexities that tormented him, a resolve which led to wider efforts and the collection of a vast amount of information upon sex life, normal and abnormal. The middle-aged amongst us may remember that 30 years ago the first of his Studies in the Psychology of Sex became the subject of criminal proceedings, and was roundly condemned as lewd and obscene. In recent years frequent public references to Havelock Ellis and his work give no hint of this stormy reception, though the series has never been published in England, and the last volume, entitled Eonism and other Studies, which was published in America last year, contains in its preface a suggestion that certain material has been omitted on account of English prejudices. In the intervening years a change of attitude has certainly taken place; venereal disease and birth control may now be publicly discussed; many young people of to-day accept as ordinary knowledge information upon sex topics that in the last century would have been forbidden to them,

[1] Havelock Ellis. London: George Allen and Unwin. Pp. 432. 18s.

and would smile in wondering derision if told of the elaborate precautions that were taken, only a generation ago, to separate the sexes when bathing. In the scientific world, though there is not yet full recognition that science must know no prejudices, yet we no longer make the pretence that difficulties and abnormalities of the sexual life can be made non-existent by ignoring them. Hence the work of Havelock Ellis can now be viewed more dispassionately, and no one can read this biography without recognising that he was far from the monster of iniquity he was once considered to be. Few of us, it may be admitted, can free ourselves as he did from the last trace of emotional reaction against subjects that the most enlightened have at some time or other regarded as repulsive, and yet only such freedom enabled him to obtain the material he has given to the scientific world, for the emotional reaction often appears as moral judgment and effectively prevents a sufferer from voicing his difficulties or even revealing their existence. The value of his clinical material may diminish as the growth of knowledge makes it commonplace, but the change in the spirit of medical science towards the problems he made his own may perhaps be the most enduring result of his labours.

THE SALVAGE OF SLAUGHTER-HOUSE AND MARKET REFUSE.

THE care and thought a city corporation to-day devotes to the utilisation of waste is well brought out in a paper on the Treatment of Organic Waste, by Mr. W. Weaver, chief chemist to the Birmingham Corporation Salvage Department, which appears in the *Journal of the Royal Sanitary Institute* for February. His plant handles, he tells us, 4000 tons of refuse in the year, in the midst of a densely populated area, without smell or nuisance, and turns out 1000 tons of feeding meals and fertilisers, and nearly 100 tons of fat. The refuse is animal or vegetable. Animal refuse is tipped out in a room with thorough exhaust ventilation into the hot flues of the destructor, and the floor is washed down and disinfected daily. Meat goes into one of the "melters," steam-jacketed at 40 lb. pressure. As the temperature of the new charge rises, steam comes off and is removed by a vacuum pump, and at last the protein material is dry and swimming in melted fat. This free fat is run off; what is left is put into heated centrifugal extractors, where any remaining fat is squeezed out, and the residue is ground into feeding meal. The total fat is collected, washed, dried, and sold for making soap or candles, its price being all the higher because it is prepared at a relatively low temperature under this vacuum treatment. Other protein "meal" is got from "slime" and "offal." Slime used to be known as gut-scrapings. It contains 90 per cent. of water, so it will not pay for drying, but the albumin is coagulated by boiling, and is then collected, dried, and ground up. The offal—stomachs of slaughtered animals, their intestines, and the contents—is in part made into fertiliser; the rest is minced, washed clean of the "contents," freed from fat, if any, and ground into a feeding meal. Bones from dustbins have a fatty film over them that attracts dirt, so they must first be washed in water at 50° C., then they are heated rapidly to get quick protein coagulation, the fat is extracted, and the remainder is ground to bone meal, a valuable fertiliser. Fish residues can be made into a good feeding meal once the valuable fish oil, which spoils the meal, has been removed. The oil from herrings or mackerel is useful in currying leather, in making linoleum, and for other purposes. All these processes are carried out separately, different melters being employed for feeding meals, for meat, for fish, and so on. In dealing with vegetable refuse, the great source of difficulty is water, generally 90 per cent. by weight. Gross forms of contamination such as metal, wood, stones, and glass, are mechanically removed, and the vegetable matter is then passed through rollers which squeeze out the water, the resultant ribbon being dried by the flue gases. So much of it is indigestible—a great deal is cork dust and grape packing—that it can only be made into fertiliser; yet it has value, taking the place of stable manure, which is now not so easily obtainable as it was.

PUBLIC HEALTH NURSES IN SCOTLAND.

A SCOTTISH education authority is inviting applications from trained nurses for appointment as nurses in the county schools. Over and above general training in nursing the qualification of the applicants is to include experience in diseases of the ear, nose and throat, eye and skin, and some training in children's diseases, as well as in a fever hospital, and preference will be given to those with school or public health experience. A salary of £120 is offered, rising by increments of £10 to £210 per annum, with an allowance of £13 for subsistence and £10 for uniform. It is instructive to note how these requirements cut across the present-day equipment of the average nurse. When the General Nursing Council was established it was realised how imperfect was the so-called general training of nurses for public health work. Nurses with four years' hospital training may have a high standard of medical and surgical experience, and yet be unqualified to deal with much that lies outside hospital practice. The general hospital trainee usually is unfamiliar with fevers, and yet fevers are certain to be among the work that falls to the school or district nurse. It is unfortunate that, owing to the splitting up of the Register, the nurse who has trained in the wide range of work required by the health authorities has been relegated to a subordinate section of the Register. While no doubt this will rectify itself in course of time, there is little doubt that as public health work develops under the new system of local government the nurse with "general training" only will not be in the running with the nurse who is trained in the institutions of the local authorities themselves. When the work of the poor-law and of the education authority is transferred to the new health authority, it will be open to the larger municipalities to train nurses in their own institutions, providing them with facilities for practice in all branches of public health and school work. It may then be regretted that the classification for registration purposes was not conceived on a broader basis, for in Scotland at least registration has suffered because public health nurses have not found it of much value. The advertisement to which we have referred is a good illustration of the reasons why. With the resources of the poor-law hospitals, the fever hospitals, the maternity hospitals, and the child welfare centres, as well as the school clinics, the new authorities will be in an exceptional position to provide a worthy training curriculum. In the Aberdeen scheme the nurses will have the advantage of training in more than one institution under the same authority. When the new system becomes general the same will be true all over Scotland.

STERILISATION OF THE FEEBLE-MINDED.

ALTHOUGH our institutions are crowded with the feeble-minded, and even the system of boarding suitable cases with families is reaching its limit, public opinion in this country has so far refused to give serious consideration to the rights and wrongs of sterilisation. Possibly the memoranda lately issued by the Eugenics Society and other bodies will awaken interest in the subject, and this is a fitting time to point out that there is no foundation for the widespread belief that sterilisation means unsexing—a belief on which a good deal of ill-informed opposition is founded. It is now 20 years since public opinion in California was convinced of the desirability of sterilising mental or defective patients who are stable to support themselves or whose families are able to care for them, and since that time 5820 California

citizens have been sterilised. Of the 3232 men so treated 2705 were insane, and 527 feeble-minded; of the 2588 women 1792 were insane and 527 feeble-minded. The procedure in use is described by Dr. R. L. Dickinson in the *Journal of the American Medical Association* of Feb. 2nd. After a patient has been studied in the State Hospital, his case is taken up by a full staff at a regular weekly or bi-weekly meeting, when the family record, the judge's report with its opinion from two physicians, and the new hospital history, are read in detail by the physician in charge, together with the results of the physical, mental, and laboratory examination. The patient then appears and is questioned by several of the six to ten persons present. Should the opinion be reached that he is a suitable subject for sterilisation, this is carried out by the surgeon in charge. In men vasectomy is performed, an inch of the vas deferens being removed on either side through a small incision in the upper portion of the scrotum. The operation is a simple one and can easily be done under a local anæsthetic, but owing to the disturbed mental state of the patient general anæsthesia is usually employed. In women a small abdominal incision is made and a portion of the Fallopian tubes, about an inch long, is resected, the divided ends being buried in the peritoneum. Dr. Dickinson suggests that since an opening into the peritoneal cavity, however carefully performed, cannot be made without some risk, sterilisation in the female might be carried out through the vagina; but vaginal cœliotomy is an uncommon operation in America, and this method of approach has not been adopted. At the end of his article he discusses other possible methods of sterilisation—in males by irradiation of the testes or even by application of heat, and in females by irradiation of the ovaries, and by closure of the openings of the tubes into the uterine cavity. With one of the new hysteroscopes an operator may locate the opening of the tubes and, using an electric cautery or diathermy electrode, he can obliterate it, the success or otherwise of this procedure being afterwards ascertained by insufflation. This method has only reached the experimental stage and further observations will be needed before it can be considered satisfactory. Dr. Dickinson's paper is of interest not only because it publishes records of the largest series of sterilising operations that have ever been done, but because it shows that the Californians have found no difficulty in putting into practice their political opinion about procreation by the mentally afflicted.

A FORM OF SPLENOMEGALY HITHERTO UNDESCRIBED.

THE spleen has come in for a good deal of attention in the course of the last few years and much has been learned about its physiology and pathology. Several more or less successful attempts have been made to classify the various forms of splenomegaly and most of these can now be correlated with disturbances either of the circulatory mechanism or of the reticulo-endothelial apparatus of the organ. The forms of splenomegaly associated with disorders of the reticulo-endothelial apparatus constitute a very interesting group, including the splenomegaly of Gaucher's disease, splenomegaly of the Niemann type, and the splenomegaly coincident with various kinds of anæmia and cholesterolæmia, of which one variety, associated with diabetes, was described by Schultze nine years ago and a second, associated with chronic cholæmia, more recently by S. C. Dyke. It almost seemed that the splenomegalies had been definitely classified and that all that remained was to fill in details, but recent observations by Fiessinger, Grégoire, and Olivier,[1] of Paris, indicate that there is yet one more form to be accounted for. The source of the spleen in question was a female patient who from 1916 to 1926 suffered from increasing anæmia with progressive though slow splenomegaly. In 1926 when the spleen was removed the blood showed 30 per cent. of hæmoglobin with 1,500,000 red cells; white cells were 4000 per c.mm., the only peculiarity of the differential count being the presence of 2 per cent. of Turck's cells. Before removal the spleen reached 10 cm. below the costal margin and its weight after removal was 580 g. Operation was followed by speedy disappearance of the anæmia and a rise in white count to nearly 8000. Macroscopically the spleen showed fibrosis with no observable abnormalities. Microscopically it was characterised by the presence of enormous numbers of giant cells, some comparable in size with those usually found in tuberculous infection, others many times larger. Caseation was absent; no "epithelioid" cells were to be seen, examination for the presence of tubercle bacilli was negative, and portions of the fresh organ introduced into guinea-pigs failed to produce any infection. Many of the giant cells showed cavities in the cytoplasm containing amorphous refractive material whose nature remains obscure. The authors hazard no suggestion about the nature of this form of splenomegaly and merely state that the report has been published at the request of several hæmatologists. It is fairly clear that it belongs to the class associated with disorders of the reticulo-endothelial apparatus, but that is as far as present knowledge goes. It is interesting to note that this type of splenomegaly, though hitherto undescribed, has not gone unrecognised in this country. Sections of a spleen presenting appearances in every way comparable with those described by the French authors were passed from hand to hand at the meeting of the Pathological Society of Great Britain and Ireland in January, 1927, and aroused a good deal of interest. Details of the case were lacking, but it was stated that the spleen had been removed with good results from a woman suffering from anæmia.

[1] Une splenomégalie plasmodiale, N. Fiessinger, R. Grégoire, H. R. Olivier, Le Sang, 1928, ii., 37.

THE PLAGUE MENACE IN SOUTH AFRICA.

Cape Town, in addition to having to cope with all the health problems of a British seaport, including a shortage of houses, is faced with a special danger owing to the infection of the veld rodents with plague. In his latest report on the health of that city Dr. T. Shadick Higgins remarks that in the last five years there has been a recrudescence of human plague in South Africa. In the year 1923–24 there were 372 cases in the Union, chiefly in the Orange Free State, but a few in the Transvaal, and 34 in the northern districts of the Cape Province. In 1924–25 there were 112, and in 1925–26 there were 71 human cases, with 26 in the Cape Province. In 1926–27 there were 75 cases in the Union, of which 46 were in the Cape Province. As yet there have been no human cases in Cape Town itself and, apparently, no plague infection among the rodents there. In 1923–24 the area of plague infection was still at a great distance. In 1924-25 there were human cases at De Aar, 500 miles from Cape Town; and in 1926–27 there were cases within 200 miles of Cape Town, with extensive infection of wild rodents. In January, 1928, the wild rodents, in an area about 80 miles from Cape Town and separated only by a narrow tract of country from the Cape Flats, were found to be heavily infected. Cape Town is situated in a district infested with gerbilles, which flourish in the sandy flats and are attracted to villages and farms in search of grain. A large anti-rodent staff is employed to keep them down, and the number of rats in the town and gerbilles in the surrounding country is actually far less than it was a few years ago. The staff is being increased and special attention is being given to the rat-proofing of all premises. It is generally supposed that the African breeding-ground of plague is to be found near the source of the White Nile, and that the disease is spread thence by traffic to Egypt or in other directions. The health report for Durban for 1926–27 shows that there is, at the moment, no risk there of direct

spread by veld rodents, but that special precautions are taken to reduce the possibilities of rat transference from up-country centres by rail as well as for the destruction and what is called the building-out of the rat. There, also, the staff engaged in this work has been increased. Earlier in this century California suffered from outbreaks of human plague, and there both the rats and the ground squirrels were found to be infected. In 1913–14 a million rats were destroyed in San Francisco and some 20 million ground squirrels in the neighbourhood. The rat is, of course, the most dangerous animal to man, because it comes in closer contact with him. It may be that the rat-flea is a more effective vector than the insect parasites of the gerbille or ground squirrel, although, speaking generally, all species of fleas found on rodents are capable of transmitting plague. It would appear, however, that up to now the human cases in the Union of South Africa have been chiefly contracted in the rural districts from the gerbille, and that the infection has not yet extended to the town rats.

THE progress of His Majesty the King continues to be satisfactory. The fact that the week has gone by without the issue of an official bulletin may be allowed to speak for itself.

The Services.

THE HEALTH OF THE ARMY.

THE annual report on the health of the Army for 1927,[1] which has just appeared, is less severely statistical than formerly—more ready to tell of changes in the health of the troops, and how treatment has improved. There were in 1927, 187,084 men in the Army, and, per 1000, there were 467·7 (454·8) admissions, 2·42 (2·35) deaths, and 11·4 (10·7) finally discharged invalids. The figures in parentheses are those for 1926. The chief causes of illness for officers and men are given as malaria, tonsillitis, pharyngitis, and bronchitis. Officers suffer more than "other ranks" from injuries and appendicitis. The chief cause of loss of service was venereal disease.

The principal causes of deaths among "other ranks" were injuries, 131; pneumonia, 73; suicide, 38; and tubercle of lung, 27; whilst the principal causes of invaliding were diseases of the ear and nose, 514; of the nervous system, 225; and tubercle (all forms), 203. Admissions for dengue numbered 982 (1644 in 1926), a fact which gains importance because the insect vector of yellow fever and dengue is the same. Diphtheria proved troublesome in 1927, and the report states that active immunisation was to be used in 1928. Most cases of dysentery were bacillary; for the amœbic variety emetine is still regarded as the best remedy. The incidence of enteric fever increased from 0·9 to 1·3 per 1000, 30 cases occurring at Shanghai; the unprotected had an attack-rate of 4·7, three times that of the inoculated, 1·6. Over 95 per cent. of the whole Army is now protected. Malaria is being reduced in India by keeping the troops in non-malarious hill stations, and by mosquito-proofing of barracks. Admissions in India this year numbered 7723, a reduction of 1500. The disease was said not to occur at Shanghai, but it nevertheless attacked the troops. Although the local carrier, *Anopheles hyrcanus*, does not enter the brightly lighted houses of residents, as many as 50 of these insects might often be found in each of the tents of the soldiers.

The number of cases of pneumonia reported was 672 (502), the especially fatal lobular form being particularly noted at Shanghai. "Pyrexia of uncertain origin" appears less often in the returns in proportion as tropical diseases are better understood, and an unknown, undifferentiated fever is hinted at in Egypt, and another in Jamaica. Tuberculosis of lung was this year equally prevalent (1·3 per 1000) among officers and men, slightly more than in 1926, when its incidence was the lowest ever recorded. Venereal disease, with a case incidence of 49·1 per 1000, increased by a fifth, the rates being 21·4 at home and 223·5 at Shanghai. For every 100 cases of venereal disease at home, the infections were gonorrhœa in 76, soft chancre in 5, and syphilis in 18. In India the corresponding proportions were 71, 19, and 10; and in Shanghai, 53, 40, and 7. Much is said about vaccine treatment of gonorrhœa, but the average duration of a case does not seem to shorten.

It is repeated, with examples, that no one who has had encephalitis lethargica will make an efficient soldier, being too untrustworthy; special efforts are being made to prevent the entry of men with middle-ear disease. Gastric and duodenal ulcers were as frequent as in 1926, but operations were more successful. A dozen interesting pages are devoted to the medical history of the Shanghai Defence Force (p. 120 seq.).

Operating theatres are being steadily improved; a portable X ray apparatus has been standardised, and there are ultra-violet lamps in all the larger hospitals. It is being discussed whether canteens should not be shut for two hours before dinner so that the young soldier may get more good out of the excellent food provided for him. On transports milk is made from butter, milk powder, and water. Stainless steel seems to be useful for water-bottles and salt cellars. Increased quantities of vaccines and sera are prepared, and there is an interesting note on the study of vaccinia at Woolwich. Dental work goes on briskly, and the example of the old soldier now reinforces the dentist's advice, whilst it is noted that after dental treatment recruits show increased self-respect and smartness. Medical units of the Shanghai Defence Force were the first to go abroad with complete dental personnel and equipment, and much good work was done in the transports during the outward voyage.

In spite of occasional disappointments, the good work done for many years by the officers of the Royal Army Medical Corps is bearing fruit, which will be a source of satisfaction to Sir Matthew Fell, the Director-General, who signs the report.

[1] London: H.M. Stationery Office. 1929. Pp. 144. 4*s*. 6*d*.

ROYAL NAVAL MEDICAL SERVICE.

R. C. Webster to be Surg. Lt.

The following appointments have been made:—

Surg. Lt.-Comdr. H. L. Douglas to *Assistance*.

Surg. Lts. H. S. Marks to *Clematis*, and J. J. Cusack to *Bridgewater*.

ROYAL ARMY MEDICAL CORPS.

Capt. V. J. Bonavia to be Maj.

Lt. (on prob.) W. A. R. Ross from the secd. list is restored to the estabt.

The undermentioned to be Lts. on prob.: W. F. Hannay (seconded), W. H. Scriven, from R.A.M.C. Reg. Army Res. of Off., H. G. G. Robertson, H. C. Benson (seconded), E. M. Hennessy (seconded), M. J. Mallen, H. E. Knott (seconded), J. Crealey, V. C. Verbi, R. Leaning (seconded), and G. F. Harrison (seconded).

ARMY RESERVE OF OFFICERS.

Lt.-Col. H. H. Leeson to be Lt.-Col.

TERRITORIAL ARMY.

Lt.-Col. L. A. Harwood, T.D., to be Bt. Col.

Lt. E. W. Ashworth to be Capt.

R. F. Ward, A. J. King, and J. C. Fotheringham to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. M. Coplans, having attained the age limit, relinquishes his commn. and retains his rank.

Majs. O. Teichman and I. H. Lloyd-Williams, from Active List, to be Majs.

NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY.—The trustees of the late Mr. C. Heath Clark have allocated £10,000 to this institute for the promotion of education in London.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXIV.—THE ELECTROCARDIOGRAM.

PART II.*—ABNORMAL RECORDS.

When *hypertrophy* affects the two ventricles unequally, so that the normal balance between them is upset, a characteristic alteration appears in the direction of the initial ventricular deflexions. When the right ventricle predominates (Fig. 6A) the upward deflexion R is larger in lead III. than in lead I. Conversely, when preponderance is in favour of the left ventricle (Fig. 6B) R in lead I. (R_1) and S in lead III. (S_3) are the prominent features. It is only when the heart is enlarged that a diagnosis of right or left preponderance should be made; for in hearts of normal size similar variations in the QRS complex may be due to the lie of the heart in the thorax, the transversely disposed heart of the short thick-set individual giving a record resembling that of left preponderance, while the vertical heart of the long narrow-chested subject tends to give one like that of right preponderance.

Students often ask what help the electrocardiogram can give in the diagnosis of *valvular lesions*. The answer to that question is that the form of the record may be modified indirectly when the valvular lesion is associated with auricular hypertrophy (Fig. 7) or with an alteration in the relative muscle masses of the two ventricles. Old-standing cases of aortic incompetence, for example, often show left preponderance, while right preponderance may be present in mitral or pulmonary stenosis.

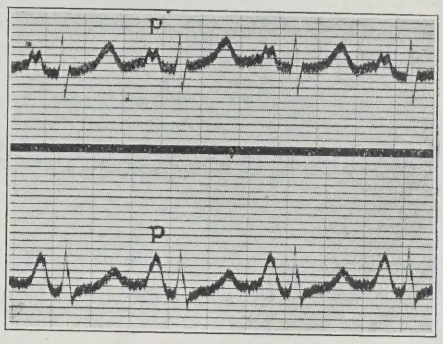
Ectopic Beats.—Variations in the amplitude and duration of the initial ventricular deflexions (QRS) are striking features in certain abnormal records. If experimentally one produces a forced beat by stimulating the apex of the right or left ventricle, the wave of excitation has to spread either through the septum or up one branch of the A-V bundle and down the other (fig. 2) to reach the opposite ventricle. It takes longer to cover the ground. Consequently the duration of the QRS group is prolonged; and, since the stimulated ventricle starts to contract before the counterbalancing electrical disturbance arises in its fellow, the initial ventricular deflexions are of unusually large amplitude.

A spontaneous *ventricular extrasystole* in the human subject is analogous to an experimentally forced beat, and the electrocardiogram (Fig. 8) consequently exhibits similar features.

Another cause of asynchronous contraction of the ventricles is a *lesion in one or other branch of the A-V bundle*. Every cycle in the record (Fig. 9) from such a case resembles a ventricular extrasystole in the increased duration of the QRS group and in the peculiar form of the T wave. When, on the other hand, an extrasystole occurs in response to an impulse arising in the auricle or A-V node, the stimulus reaches the ventricles by the normal pathway, and consequently only the auricular complex (P) is modified. A series of such premature beats constitutes what is called a paroxysm of tachycardia (Fig. 13). In health the rapid ventricular deflexions are sharp and clean. R and S waves which are notched or slurred in either lead I. or II. are abnormal.

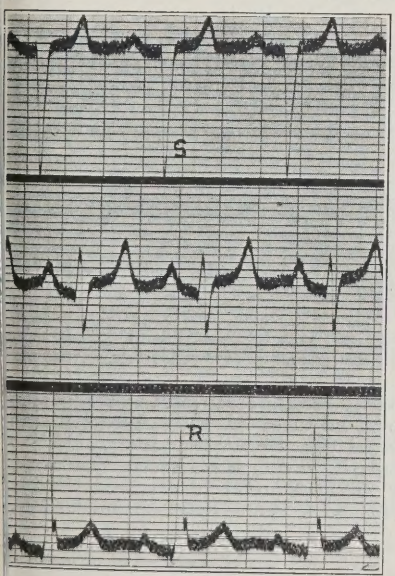
Heart-block becomes a fascinating subject when studied electrocardiographically. In its mildest form it cannot be recognised without the aid of graphic records, for the rhythm of the heart is undisturbed, though the normal pause between the commencement of the auricular and ventricular contractions is prolonged. This is depicted graphically by lengthening of the "P–R interval," which in health (except in athletes) never exceeds 0·2 sec. Heart-block of a more severe grade is characterised clinically by the occurrence of intermissions in the pulse. The mechanism of this disturbance is very beautifully shown in the electrocardiogram. In the third cycle of Fig. 10 the P–R interval is less than $\frac{1}{5}$ sec. In the fourth it is almost 3/10 sec., while the fifth impulse (P_5) is completely held up and fails to reach the ventricle. This sequence of events is precisely repeated in the next three cycles. A record such as this gives one a remarkably vivid picture of what is taking place. The

FIG. 7.



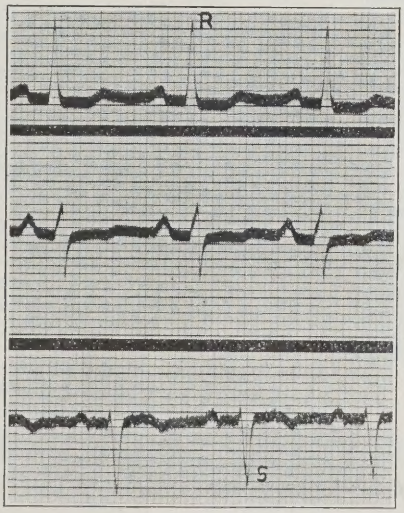
Auricular hypertrophy. The P wave is notched in lead I. and of unusually large amplitude in lead II.

FIG. 6A.



Right-sided.

FIG. 6B.



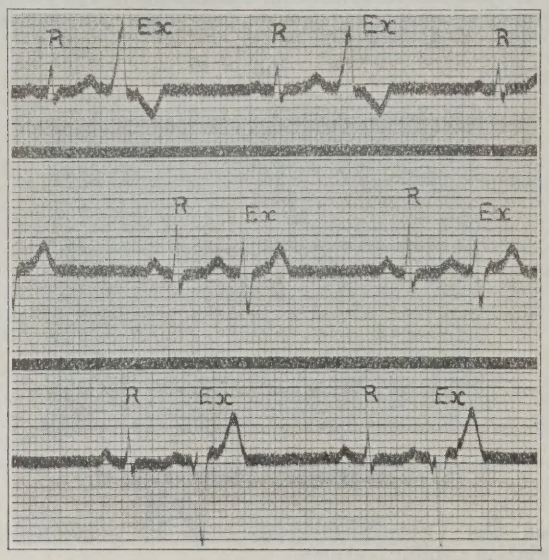
Left-sided.

Ventricular preponderance. (3 m.v. = 3 cm.).

* Part I., Normal Records, appeared last week.

series of auricular impulses is like a convoy of wagons crossing a muddy swamp; each wagon makes the ruts deeper, the going becomes heavier and

Leads FIG. 8.

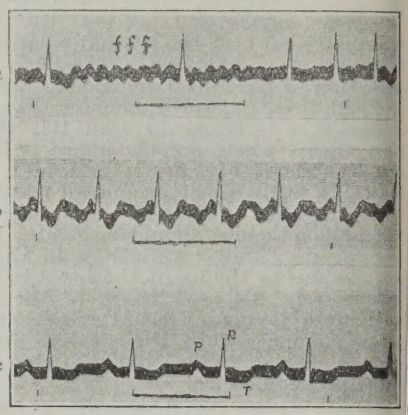


Ventricular extrasystoles (Ex.) follow each normal beat (R). (3 m.v. = 2 cm.)

heavier, till eventually the road is no longer passable, and the next wagon has to wait until temporary repairs have been carried out.

Auricular Fibrillation.—Electrocardiographic control of the treatment of auricular fibrillation with quinidine affords another glimpse behind the scenes. Hour by hour, as the heart comes more and more under the influence of the drug, we can watch the gradual increase in duration and regularity of the auricular wavelets (fff, Fig. 11, *a*) marking the transition from fibrillation to flutter (Fig. 11, *b*), and enabling us to trace the relationship of two conditions which clinically appear so widely different. The enemy is gradually withdrawing from his outer defences as the bombardment grows hotter. Then suddenly a shell bursts in the very midst of his magazine. The day is won. Normal rhythm has been restored (Fig. 11, *c*).

FIG. 11.

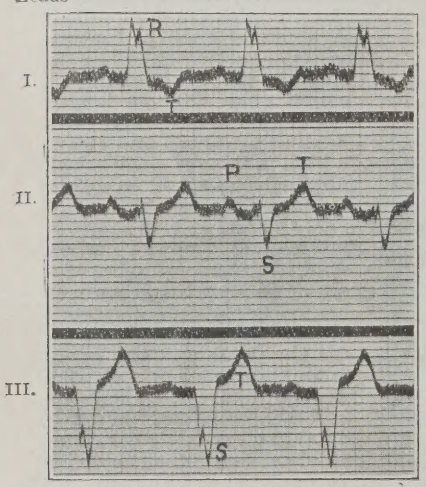


Three records from a case of auricular fibrillation treated with quinidine: (*a*) fibrillation; (*b*) flutter; (*c*) normal rhythm. Black line under each record = time interval of 1 sec.

Conclusion.

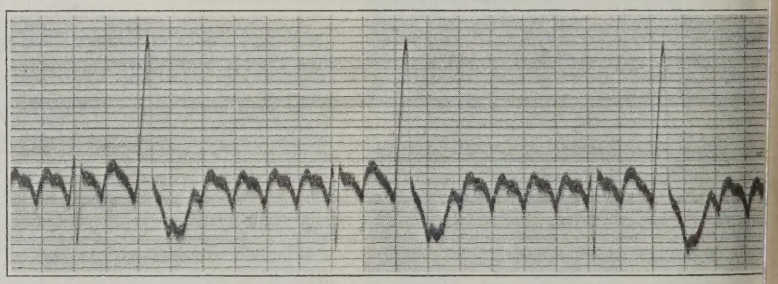
Heart-block and fibrillation are but two examples of the romance of electrocardiography; there are many others. A single case may serve to illustrate the clinical importance of this investigation in diagnosis and prognosis. A stout and pampered invalid of 66 had suffered for 15 years from pain in the chest, in addition to various other ailments. There was nothing abnormal to be found on physical examination of the cardiovascular system. The highly strung nervous temperament of the patient, and the fact that the pain frequently came on when lying down, and could be relieved by standing up and walking about had led her doctor to discount the subjective symptoms, and to label the case "pseudo-angina." An electrocardiogram, however, revealed bundle branch block, a finding which completely reversed the prognosis, and the patient died suddenly a month later.

Leads FIG. 9.



Bundle branch block.

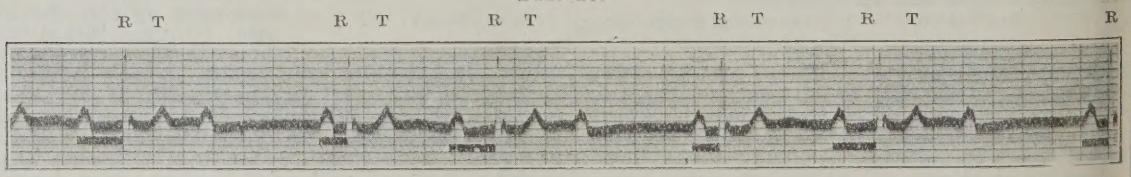
FIG. 12.



S. Ex. S. Ex. S. Ex.

Record from a case of auricular flutter with complete heart-block and bigeminal action. S = Normal beat. Ex. = Extrasystole.

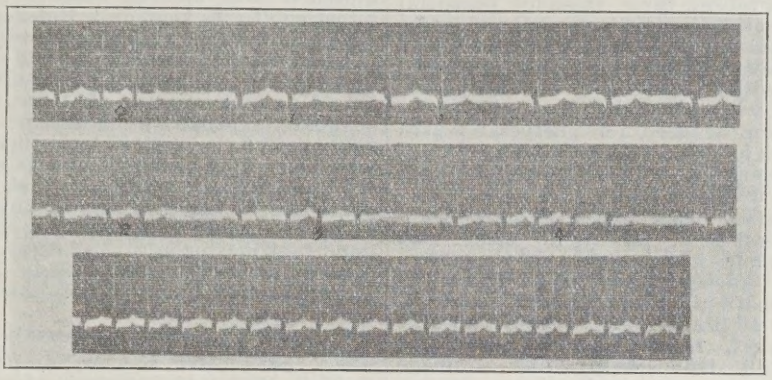
FIG. 10.



Partial heart-block (3 mv. = 2 cm.) The black rectangles indicate varying conduction time in different cycles.

No one is likely to question the importance of the advances in our knowledge of the disorders of the cardiac mechanism which we owe to the electrocardiograph; but, since it is the function of the practitioner to combat disease, he will naturally ask, "How can this instrument help us in the diagnosis and treatment of our patients?" The answer to that question is that the electrocardiograph can often furnish definite objective evidence regarding the condition of the all-important heart muscle; and what is more, it can sometimes do so when other methods of examination are almost, if not completely, impotent. It is not only in the more complicated disorders of the cardiac mechanism, such as that illustrated in Fig. 12, but also in cases where the history is inconclusive and the physical examination yields little help, that the additional evidence furnished by the electrocardiogram may be of so much value. A normal electrocardiogram, on the other hand, does not necessarily signify a normal heart. As in the case of the Wassermann reaction, it is only a positive finding to which one can attach much weight. In conclusion one must emphasise the importance of remembering that electrocardiography like all laboratory methods of diagnosis is merely supplementary to the clinical investigation, and that the results obtained must always be considered in conjunction with the clinical evidence. In diagnosis electrocardiography, like radiography, may hold the casting vote; but the ordinary clinical methods are necessary to form a quorum.

FIG. 13.



These three records were taken from the same patient at the same sitting. The upper record shows single extrasystoles (1), the middle record groups of two (2), three (3), and four (4) extrasystoles, and the lower record a paroxysm of tachycardia, in which the ventricular complexes are similar in form to those of the extrasystoles in the upper two records.

CRIGHTON BRAMWELL, M.A. Camb., M.D. Manch., M.R.C.P. Lond.,
Assistant Physician to the Manchester Royal Infirmary.

Special Articles.

PROBLEMS OF MATERNITY AND CHILD WELFARE.

GROUP MEETING OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

MANCHESTER, FEB. 21ST TO 23RD, 1929.

AT a meeting of the Maternity and Child Welfare Group, held at Manchester and presided over by Prof. LOUISE MCILROY, the first session was given up to a discussion on

Puerperal Fever.

Prof. W. FLETCHER SHAW, in the opening paper, dealt with autogenous and exogenous sources of infection. He believed, from his clinical experience, that autogenous infection was very rare, and that most cases of sepsis were exogenous, though some were not controllable by, or attributable to, the medical or nursing attendant. The husband was one factor, the patient's own dirty hands another, and the handywoman a third. It was dangerous to exaggerate the importance of autogenous infection because it might lead to less care. In teaching he would almost disregard autogenous infection and work for the prevention of exogenous infection by insisting on careful preparation of the hands of nurse and doctor. Attendance on midwifery cases in unsuitable homes was apt to induce a hopeless attitude towards asepsis. If the same attitude were adopted in surgery we should soon be back in pre-Listerism. Every case of puerperal infection was a reason for close self-examination by the attendant. He believed that the tar derivatives had done much harm—partly because they were used in dilutions which were quite ineffective. He would like to go back to perchloride and biniodide. Turning to administrative measures, he held that to ensure early recognition of disproportion by antenatal work was a difficult task even for a practised obstetrician, who was able to discover his errors in antenatal work by following up his cases; the young, inexperienced, whole-time practitioner who frequently conducted antenatal clinics was not able to follow his cases and learn from his errors. The Government had stepped in ineffectively. Diagnosis was comparatively easy, but there was no proper hospital accommodation available. He did not believe in cases of puerperal fever being treated in fever hospitals, where the medical staff might or might not be interested in obstetrics. For rural cases frequently the only provision was an isolated fever hospital. At present consultant obstetricians had no opportunities for clinical research in wards, but only on sporadic cases.

The need for better training of the practitioner was realised, but the public must also be educated. Antenatal clinics should be staffed by the obstetricians who were going to see the cases through; those who held the antenatal clinics must know the ultimate result of the labours. The young well-trained administrator might be better versed in modern midwifery than some of the general practitioners, but he should use his knowledge in a helpful rather than in a critical way. Treatment should be carried out by those who were clinically interested in this work, and antagonism between the administrator and the clinician must cease.

Prof. H. B. MAITLAND said the *Streptococcus hæmolyticus* was the chief bacterial offender; carriers of this organism were quite common. The same toxin was produced in scarlet fever, puerperal fever, and erysipelas; it might be logical to apply the Dick test and the use of scarlet fever antitoxin in pregnancy. Immunity to the toxin did not imply immunity to the streptococcus infection, but something useful might result from the establishment of toxin immunity in pregnancy, even if antibacterial immunity could not be obtained.

Dr. F. H. LACEY described methods of avoiding vaginal infection in the later months of pregnancy. He urged medical practitioners to employ midwives and not handy-women. Midwives should be subsidised,

and sterilised outfits should be provided. Both medical student and midwife needed to obtain experience in puerperal fever. Separate hospital wards should be provided for cases regarded as specially liable to sepsis before admission. Tactful administration was needed; early notification and early treatment had not been secured. During the previous three days he had seen in consultation three cases of puerperal sepsis which were notified only when moribund. One of the best hospitals he had seen was at Norton, Sheffield, not a fever hospital. Antenatal clinics should be conducted by expert obstetricians, preferably in connexion with maternity hospitals; fever hospitals should not be used for puerperal sepsis. From his experience he could say that the services of the consultants appointed in the Manchester neighbourhood were not utilised.

Dr. J. H. KERR stated that Monsall Hospital had a well-trained puerperal unit; he saw no reason why fever hospitals should not be used if they were provided with an efficient staff. Dick tests and subsequent immunisation during pregnancy should be tried; it might be advisable to have separate wards for Dick-positive cases. He described the advantages of Dr. Remington Hobbs's glycerine drainage treatment, and also its contra-indications. It was desirable that the coroner and medical officer of health in conference should have power to order a post-mortem examination in all deaths occurring within 28 days of childbirth. Clinical pathologists might be called in consultation before the gynæcologist, who would then have the pathological report before them.

In the general discussion which followed the limited use of the consultants provided was confirmed, also the want of coöperation between the administrators and the obstetricians. The investigation of puerperal deaths was discussed and complaints of overlapping of officials were ventilated. There appeared to be general agreement that investigations at the home should be carried out by a senior medical administrator. As regards antenatal clinics, it was claimed that they were only a stopgap till a better obstetrical service had been secured, and that some benefit was obtained even if the medical officer in charge was not always able to follow up his cases. It was pointed out that whole-time officials were often appointed because the general practitioners would not do this work.

The PRESIDENT claimed that the statistics needed to be put on a proper basis. She considered that teeth were quite important as an autogenous source of infection. She described the methods adopted at the Royal Free Hospital, where septic (except V.D.) cases were detained for treatment, but were kept in separate wards. Open-air treatment and colon lavage had been found beneficial. It was necessary to have postnatal as well as antenatal clinics. She strongly favoured the glycerine treatment in suitable cases. She believed resistance to infection was lowered by prolonged labours and advocated a greater use of sedatives and anæsthetics. The investigation of maternal deaths must be carried out tactfully and by a medical practitioner.

Other Topics.

Dr. C. P. LAPAGE dealt with endocrine deficiency in children and also brought up to date the information given by him in THE LANCET (1926, i., 176) with respect to pink disease. Since his first case in 1923 he had now seen about 70, only three of which had been diagnosed beforehand. At present this disease was not known to practitioners, but only to hospital residents. Any practitioner who had once seen a case would not miss another. Most of the children were under three and some were entirely breast-fed. There was seldom more than one case in a family; the infectivity appeared to be on a par with that of poliomyelitis. A few cases died from broncho-pneumonia but 90 per cent. recovered, though occasionally not for a year. The cause and pathology were still mysteries. Some of the names given to the disease were misleading, because polyneuritis and œdema were not constant symptoms. He suggested "acroerythema." As to treatment, as yet good nursing and keeping warm were the main things.

Dr. M. J. ROWLANDS dealt with the effects of vitamin B deficiency on the intestinal tract and illustrated his lecture with lantern slides of the dilatation of the stomach and the atrophy of the muscular and mucous coats of the stomach and intestine of rats kept on a B-deficient diet. Further slides showed the resulting intestinal stasis and the progress up the lacteals of specific bacteria fed to those rats in broth. Applying these results to human beings, Dr. Rowlands suggested that they afforded an adequate explanation of the bearing of intestinal toxæmias on rheumatoid arthritis and of the route by which the colon bacillus found its way to the bladder, via the lymphatic system, in that disease. A similar dilatation of the stomach in human beings as the result of vitamin B deficiency would obviously be an important matter in cardiac cases. He believed that modern diets were more likely to be deficient in B-vitamin than in any of the other vitamins.

SECOND SESSION.

At the second session, presided over by Dr. F. T. H. WOOD, the discussion turned on the

Diet of the Young Child.

Prof. STUART COWELL led off with an exposition of the views held by research workers as to the dietetic needs of the young from conception to adolescence. He gave as evidence that all was not well: the poor physique of many of our urban children, the liability of the young child to intestinal, respiratory, rheumatic, and tuberculous infections, to disorders of calcification, such as rickets and ill-formed teeth (with effects lasting through life), and to enlarged tonsils and adenoids. He showed the need for a diet for the child (supplied through the mother from conception to weaning) which contained sufficient vitamin D and calcium, sufficient vitamin A to promote resistance to infections, sufficient iron to guard against nutritional anæmia; in goitrous districts iodine should be given under medical direction. He went on to indicate from what foods these various requisites could be obtained. The main error in children's diets was the deficiency of the fat-soluble vitamins A and D. The distribution of these vitamins was similar except that the amount of vitamin D in green vegetables was negligible. For safety extra vitamins should be given to breast-fed as well as to bottle-fed infants in the forms of cod-liver oil (beginning with a quarter of a teaspoonful a day at 2 weeks old, increasing to one teaspoonful at 3 months and 3 teaspoonfuls at 9 months, to be continued throughout young childhood), egg-yolk in small quantities (for its iron content) from the third month, and orange-juice. Mrs. May Mellanby had shown that vitamin D was not only essential for building good teeth, but also had the power of preventing the extension of decay in children's teeth. The anti-calcifying elements in such cereal foods as wheat germ and oatmeal should be counteracted by specially abundant supplies of both vitamins A and D. Unbalanced wheat germ, if given in considerable quantity, might produce permanent degenerative changes in the spinal cord. He was not convinced that there was any widespread vitamin B deficiency in this country. If there was reason to suspect B deficiency in individual children he thought it was wiser to give some yeast preparation, such as marmite, which contained vitamin B_2 as well as B_1, rather than cereal germ which contained chiefly B_1 (the antineuritic element) and possessed the toxic properties just mentioned. Prof. Cowell believed that the improvements in the standard of nutrition and physique were within reach if the comparatively simple measures founded on recently acquired knowledge were adopted.

In the discussion which followed the defenders of oatmeal brought the reply from Prof. Cowell that its toxic effects could be counteracted by plenty of milk and eggs.

Dr. CATHERINE CHISHOLM questioned the need for

giving egg-yolk to breast-fed infants. She found it possible to give chopped raw greenstuffs to babies in their first year. She advocated plenty of water and had great faith in cod-liver oil.

Dr. GEORGE G. CAMPION, speaking as a dental surgeon, was convinced of the truth and importance of Mrs. Mellanby's work. To some extent dentists were divided as to the relative importance of food and function, but these two schools of thought were not really contradictory but complementary.

Dr. H. SCURFIELD thought a better dietary was the most important item in public health advancement. Up to 1910 the feeding of the ex-baby was a matter of old wives' tales. They did not yet know what a weaned infant was ready to digest. For example, some pediatricians were afraid of bananas, but others found that, if crushed, they were good for infants a few weeks old. He commended a paper by Dr. Clara M. Davis on Self-selection of Diet by Newly-Weaned Infants [1] as worthy of consideration.

The PRESIDENT suggested that the Group might take in hand the preparation of dietary tables.

Visit to the Manchester Babies' Hospital.

Among the visits paid by the members to institutions was one to the Manchester Babies' Hospital. This institution, opened in August, 1914, as a 12-cot hospital for babies suffering from disorders of nutrition, has developed into a model hospital with specially built open-air wards, equipped with every scientific device and accommodating 80 babies. The nursing staff, including probationers, numbers 40 and there are in addition three wet nurses for premature infants. A cot and apparatus used for the supply of atmospheres enriched by oxygen and carbonic acid to infants suffering from certain forms of infantile atrophy was demonstrated by Dr. Edith McCrea. Some 30–40 infants, which had had a stationary weight for months without any discoverable cause and had not responded to other treatment, had during recent months gained weight on this régime.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Voluntary Hospitals.

LAST year, after an interview with the Secretary of State, a Liaison Committee was formed by the Scottish branch of the British Hospitals Association. The intention was that this committee should keep in touch with the Department of Health so that the Department might be kept aware of the policy of the voluntary hospitals. At the same time, the Scottish Regional Committee of the British Hospitals Association would continue their work of organisation and coördination of the Area Committees. At a recent meeting in Glasgow there seemed to be a little confusion between the functions of those committees. This, however, will clear itself up; since the Liaison Committee is meant to represent all the area committees of the various localities. An important point of the meeting was that general agreement was expressed that the new clauses in the Local Government (Scotland) Bill were satisfactory in that, under the new arrangement, the poor-law stigma would no longer affect hospital admissions. Colonel Mackintosh said that at the first meeting of the Liaison Committee, Major Elliot submitted a proposal, put forward by the Corporation of Glasgow, to empower the local authorities to remove hospital service entirely from the poor-law and to provide hospital treatment for all kinds of sickness, as in England and Wales. As representatives of the voluntary hospitals, said Colonel Mackintosh, the Liaison Committee could not stand for discrimination in quality of hospital treatment between paupers and non-paupers. They recognised that the only way to avoid that was to remove hospital treatment from the poor-law, and that that could only be done by conferring on the Scottish authorities the same general powers as the English authorities. This step was inevitable and, indeed, the removal of the poor-law stigma was one of the conditions of full coöperation between voluntary hospitals and the public authorities. They could not contemplate the growth of a general hospital service which would prevent complete coöperation with the voluntary hospitals, but they advised the removal of the hospital service from the poor-law, under conditions that would provide as full safeguards as possible for the voluntary hospitals. As a result of their meetings with the Department of Health, a new clause had been provided with a view to removing the poor-law stigma from hospital service, and the Scottish voluntary hospitals would secure in the new clause provisions that substantially safeguarded their future place in the scheme of hospital service. With that new power the way was now open for full coöperation in hospital service. Col. Mackintosh's statement marks a very important departure in Scottish hospital coöperation. It is satisfactory to know that, under the new Bill, the whole problem passes on to a more satisfactory plane.

Glasgow Hospital Sunday Fund.

The Glasgow Hospital Sunday Fund shows a slight decrease on the £10,000 collected in 1927. The number of churches contributing was 555, against 522, and the number of Sunday schools was 310 against 301. The average amount per church was £15 17*s.* 10*d.*, as against £17 8*s.* 10*d.* in the previous year; but the average per Sunday school was £3 7*s.* against £3 2*s.* It is interesting to note the relative contributions of the leading churches. Thus the Church of Scotland contributed £2611; the United Free Church, £4300; the Roman Catholic Church, £499; the Episcopal Church, £192. It is also interesting to recall that the great Dr. Chalmers, in his famous parish of St. John's, maintained that the Established Churches ought to support their own poor. He was entirely opposed to the poor-law rate, but was at the same time in favour of public free education. This was before 1845. In spite, however, of the rating system of poor relief, the voluntary hospitals have steadily received contributions from all the leading churches, but the hospital finance of to-day is a gigantic thing compared with what it was in Dr. Chalmers's day, and his parochial proposals could not face the poor-law or Unemployment or Health Insurance of our modern communities. Under his inspiration St. John's parish did marvels; but his efforts were only a beginning, and even poor-law problems, as understood to-day, were hardly known. It is well to keep these facts in mind when comparing superseded systems with the larger systems that developed from them.

The Glasgow Western and the Glasgow Victoria, like the Royal Infirmary, show slight decreases on their contributed income; but this is only to be expected after so many years of serious unemployment.

The Sick Light-keeper on Pentland Skerries.

Owing to the serious gales, there has been great difficulty in conveying advice to the sick lightkeeper on Pentland Skerries. This is one of the most difficult rocks in the North Sea. Normally, mails and provisions are sent by boatmen from South Ronaldshay, five miles off; but in the emergency this was impossible. The keepers at the Pentland Skerries have a wireless receiving set, but not a transmitter. The symptoms of the sick principal were signalled by morse lamp to the boatman at Broughness, and then transmitted to Stromness by telephone. A doctor was able, at stated hours, to send instructions from the northern lighthouse transmitting station at Stromness. For several years the Highlands and Islands Medical Service section of the Scottish Board of Health, now the Health Department, have assisted the local telephone service between islands; but the lighthouses are under the direct management of the Northern Lights Commissioners. The local expense

[1] Amer. Jour. Dis. Child., 1928, xxxvi., 651.

of transmitter equipment has been a standing difficulty and, in spite of the coöperation of the War Office and the Post Office, some localities are still inadequately provided for.

Queen's Nurses.

In the recent appeal for the Queen Victoria Jubilee Institute for Nurses and the Scottish Nursing Associations, Scotland has on the whole done well. As a national memorial to Queen Alexandra more than £87,000 has been subscribed in Scotland, this sum being more than a third of the gross amount of £233,086 collected in Great Britain, Northern Ireland, the Irish Free State, and the Dominions Overseas. The figure aimed at was 7*d.* per head of the population, and this was exceeded in many counties; but the general strike and the coal strike affected the collection adversely. The amount available for the Queen's Institute itself is nearly £47,000. Queen's nurses, it may be noted, are steadily increasing their work for the various health authorities, and the process thus established will be materially accelerated under the new system of local government.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

A Cancer Campaign in Queensland.

DURING the last 15 months more than £50,000 has been collected in response to an appeal for funds to extend the facilities for the treatment of cancer in Queensland. A good deal of publicity has been given to the appeal by the daily press, and popular education in the detection of early signs of cancer, the available methods of treatment, and the danger of "quack" treatment has been carried out by lectures and articles. The campaign is now about to be closed, and the funds collected will be handed over to an appointed trust.

The original intention of the campaign committee, whose president is Dr. E. Sandford Jackson, was to set up a treatment centre in the State capital. This was to be modelled on an institution at Toulouse in France, and the estimated cost was £28,000. The proposal was later modified in favour of providing modern installations for radium and X ray treatment at existing hospitals; it was thought that cancer patients would more readily attend a general hospital than a cancer hospital, whilst early cases are more likely to go to the out-patient department of a general hospital than to a special clinic. The first installation, which was officially opened on Dec. 20th, is now in operation. It consists of a deep X ray therapy plant at the Mater Misericordiæ Public Hospital, Brisbane. The plant is capable of generating 300,000 volts, and the cost was £3500, which includes the cost of installation. Half a gramme of radium has been purchased by the committee for use throughout Queensland. The cost was £6000, and a further £1000 will be spent on insurance, needles, and applicators. Through the good offices of the Governor of Queensland, Lieut.-General Sir John Goodwin, the radium was obtained through the British Empire Cancer Campaign. Sir John was until recently the honorary organiser of that campaign, and the Queensland Committee owe much to his tactful guidance.

The committee are concentrating mainly on the therapeutic aspect of cancer. While accurate records will, of course, be kept, research is limited in Queensland because there is no medical school in the State University. The main difficulty which they have to contend with is the provision of treatment facilities over a very large area (670,000 square miles) with a scattered population (914,000), of whom over half live in the cities, and 32 per cent. in Brisbane alone. It will ultimately be necessary to equip the hospitals at the country centres of Toowoomba, Rockhampton, and Townsville with deep X ray and radium facilities. The Commonwealth Department of Health has already established laboratories at these centres, and the pathological work can thus be performed efficiently. Blair Bell's lead treatment was recently studied by two members of the committee, Dr. Graham Brown and Dr. L. M. McKillop, who were given extensive facilities during their visit to England. The preparation of therapeutic compounds of lead has been begun in Australia.

Judging from personal observation, the public have responded to the instruction about the early signs of cancer. In the dry, hot, and sunny plains of Western Queensland, basal-celled carcinoma (rodent ulcer) of the face, and less so of the hands, is comparatively common. This is attributed to the long-continued exposure to the sun, and the insufficient protection of the face afforded by the narrow-brimmed felt hat in common use. As an offset to this incidence, tuberculous lesions of the skin are extremely rare; in fact, surgical tuberculosis is practically unknown, although pulmonary tuberculosis is fairly common.

MEDICINE AND THE LAW.

Advertisements of Abortifacients.

SOME of the advertisements of alleged remedies for female complaints which newspapers publish are little better than incitements to criminal abortion. It would be a nice legal question how far the newspapers concerned could be indicted as accessories before the fact. Parliament has hitherto not prohibited such advertisements as those of venereal disease remedies were prohibited in 1917; the only possible restriction, therefore, is by voluntary action on the part of the organised bodies of the newspaper and advertising world. The Advertising Association, over which Lord Riddell presides, has issued a most important memorandum to the Press of the country on the advertising of abortifacients. The memorandum frankly emphasises that so-called "irregularity" in a woman is in the great majority of cases a symptom of pregnancy; in the other cases it is probably a symptom at least of a condition requiring skilled medical treatment and sometimes of serious disease. A warning that the advertised "remedy" is not to be used by pregnant women is particularly mischievous as it will amount to a positive inducement to acquire the remedy for the purpose of abortion. The memorandum remarks that the Advertising Association has consulted the Director of Public Prosecutions concerning the advertisement of remedies for female "irregularities" and that he has expressed the firm opinion that such advertising is a serious source of danger to those whom it reaches, and has stated that it is being closely watched by his department. The memorandum also recalls the fact that witnesses before the Parliamentary Select Committee on Patent Medicines made it clear that in most cases these advertised "remedies" are definitely and deliberately purchased where pregnancy is admitted or suspected in the belief that they will terminate that condition. Finally the Advertising Association, after recognising that many newspapers already exclude mischievous advertisements of this sort, calls upon the Press as a whole, and upon all advertising agents and others concerned, to decline to accept any advertisements of drugs or treatment purporting to be remedies for disorders generally termed irregularities, female ailments, or women's complaints. This action will be generally approved by competent opinion as a public service of great value to the community. The indirect effect of the memorandum will not be inconsiderable, for, if any advertising agent or newspaper manager found himself within the reach of the law he would no longer be able to plead ignorance of the effect of the offending advertisement. The action of the Advertising Association will have made the publication of such advertisements in future a particularly deliberate act. If the memorandum does not have the full success which it deserves it will really be desirable for Parliament to take notice of the minority of newspapers which ignore the warning.

Correspondence.

"Audi alteram partem."

OPERATING FOR APPENDICITIS.

To the Editor of THE LANCET.

SIR,—In his Hunterian lecture, published in your last issue, my friend, Mr. McNeill Love, gives some interesting figures concerning the treatment of appendicitis, but I confess I am unable to make out exactly what cases are included in the group treated by expectant methods. Just before Table I. he speaks of "an analysis of the remainder," but under the heading "Treatment of General Peritonitis," he says:—

"In cases of general peritonitis, appendicectomy certainly appears to be the rational treatment, rather than temporising with a perforated or gangrenous appendix, which provides a constant stream of infection."

Are we to conclude, then, that the cases of general peritonitis were excluded from the "remainder," and operated upon as a matter of course and, if so, with what mortality? Even the mortality of 3·8 per cent. given for the total of 607 cases treated expectantly is not the final index of the risks these patients ran, for there may have been some mortality following the subsequent operation for the removal of the appendix. (I had two deaths among my first 618 cases of interval removal). There may also be some of the patients who refused to have the *fons et origo mali* extirpated, who will subsequently lose their lives as the result of an attack of appendicitis, while I take it that the survivors among those who fortunately recovered after the hazard of an immediate operation were ridded of the cause of subsequent appendix trouble.

Even if statistics can be made to prove anything, they are at least some sort of a standard for comparison, and are ever interesting. It has always been my practice to regard acute appendicitis as an emergency requiring surgical intervention. The exact period at which to intervene, and the scope of the operation, I hope have been the subject of an informed discrimination rather than rule-of-thumb, but I have never deliberately advocated the expectant method as an alternative to operation. Over 20 years ago I commenced to classify my cases, as in the following table, and though it may sometimes be difficult to decide in what group a case should be placed, it matters less when the whole of the results are presented.

All Cases of Appendicitis to End of 1928.

Group	—	Cases	Deaths	Percentage
	Acute appendicitis:			
1	without peritonitis ..	135	0	—
2	with localised peritonitis ..	395	4	1
3	with flank or pelvic peritonitis, or both	206	16	7·7
4	with diffuse peritonitis ..	95	28	29·0
5	with residual abscess ..	64	5	7·8
6	with primary localised abscess	424	14	3·2
7	interval removal	913	3	0·3
8	with primary complications	20	9	45·0
	Total ..	2252	79	3·5

The list includes all the cases on which I have personally operated up to the end of 1928. Group 5 consists of cases in which there has been some unlimited peritonitis which has subsided and left an abscess. In group 6 the abscess has developed around the appendix wherever situated, and has been localised from the start. Group 8 includes cases such as acute intestinal obstruction and pylephlebitis, hence the high mortality, but since an existing acute appendicitis was the primary lesion, they cannot fairly be excluded.

I should prefer that your readers should analyse the figures as they wish. If we exclude the interval removals in Group 7, we obtain a grand total of 1339 cases of acute appendicitis, with 76 deaths, a mortality of 5·7 per cent. In these days, with so many men in the profession who have been trained since the problem of the diagnosis of appendicitis has been fairly well understood, I think we have a right to expect that the great majority of cases should reach the surgeon in Groups 1, 2, or 3. In my series this gives a total of 736, with 20 deaths, a mortality of 2·7 per cent. Cases must sometimes go on to develop abscesses, but even so the combined abscess groups (5 and 6) give 488 cases with 19 deaths, a mortality of just over 3·8 per cent.

One or two other points. Under the heading of Criticisms of Delayed Treatment, Mr. Love speaks of the method of drainage to be employed when a gridiron incision has been used. This incision is in every way unsuitable for cases that may require drainage, and surgeons who employ it in these cases will get such a heightened mortality as may well be a factor in converting them to the expectant method. I do not think Mr. Love mentions Battle's incision, but I know that this is frequently employed in the South of England, and is almost as unsuitable for dealing with appendix abscess as the gridiron, and has probably a very adverse effect on the mortality. The oblique muscle-cutting incision of Rutherford Morison[1] gives by far the best approach in acute appendicitis, and is especially useful in dealing with abscess cases. May I say to Mr. Love that ". . . to literally *tear out* (my italics) two appendices which were firmly matted and behind a turgid cæcum," may well have been the cause of the deaths of the two patients, but it was not surgery.

I am sorry I have not the time to comment on the other questions dealt with in Mr. Love's interesting and important lecture.

I am, Sir, yours faithfully,

G. GREY TURNER.

Newcastle-upon-Tyne, Feb. 25th, 1929.

TUMOURS OF THE SPINAL CORD.

To the Editor of THE LANCET.

SIR,—Dr. Theodore Thompson's interesting article on Leptomeningeoma of the Spinal Cord in your issue of Feb. 16th contains some statements which show that old-established error dies hard. With regard to the cerebro-spinal fluid he says first, that "it is generally assumed that the cellular content of the cerebro-spinal fluid below a spinal block produced by a non-inflammatory lesion such as a tumour remains unaltered." This assumption was made by Nonne in 1910, but much has been written on the subject since his paper on the Compression Syndrome, which has shown that this and several other assumptions which he then made were incorrect. For example, the "compression syndrome" as defined by Nonne often results from subacute and chronic meningitis without compression. The absence of cells does not prove the non-inflammatory nature of the spinal block any more than the presence of cells excludes the diagnosis of tumour. Next Dr. Thompson perpetuates the curious error that the syndrome described by Froin in 1903 was characterised by "a normal or but slightly raised cell count." The contrary is the case, as Froin specifically mentioned the presence of "lymphocytose" as constituting the third element in the syndrome along with "xanthochromie" and "coagulation massive." Dr. Thompson also speaks rather loosely of "spontaneous coagulation" which is not by any means the same thing as "coagulation massive" or "en masse" as Froin described it. Some spontaneous coagulation in a yellowish fluid may be present in cerebral as well as in spinal tumours, and is common in a variety of other conditions; "coagulation en masse" is much more rare, and is confined to spinal conditions of which the commonest is spinal block. If the term "syndrome of Froin" is to be retained,

[1] THE LANCET, 1901, i., 533.

it should surely be limited to its original significance, or at least confined to fluids which are very highly albuminous, in which case one might use some such term as "modified syndrome of Froin." Froin's cases were, of course, not cases of spinal tumour, but of subacute meningitis probably of syphilitic origin.

Dr. Thompson then speaks of "increase of mineral salts" in such fluids. If by that term he refers to calcium he is correct, but sodium chloride is also a mineral salt and it is constantly below the normal percentage in highly albuminous fluids. He is also somewhat inexact in his reference to the Queckenstedt phenomenon, which he includes among "general methods for raising the general pressure in the (subarachnoid) space." The value of Queckenstedt's method of compressing the jugular veins is that the increased pressure which it causes is limited to the contents of the cranium and may be transmitted thence to the spinal theca in the absence of spinal block. Anything which raises the *general* cerebrospinal fluid pressure, such as coughing or holding the breath, or compressing the patient's abdomen, will cause a rise in the lumbar manometer whether spinal block is present or not. In fact the evidence given by the Queckenstedt method is most definite when coughing causes a rise in the manometer but jugular compression does not.

Again, why does Prof. Turnbull use the obsolete term "gliosarcoma" in describing a typical neurofibroma? Whether the view be taken that these tumours are fibromas growing from and attached to nerves, or tumours derived from some more specifically nervous tissue such as the sheath of Schwann, the name "neurofibroma" is equally applicable and it is consecrated by many years of use. The more modern terms "neurinoma" or "Schwannoma" imply subscription to definite theories as to the origin of the tumour, and, until these theories are proved, should be avoided. But it seems unnecessary to retain such a meaningless term as "gliosarcoma."

As a final question, why is the name "leptomeningeoma" used in the title of the paper, when one of the tumours arose from a nerve root and the other two from the dura mater?

I am, Sir, yours faithfully,

J. G. GREENFIELD.

Pathological Laboratory, National Hospital, Queen-square, W.C., Feb. 19th, 1929.

THE NUCLEUS OF THE CANCER CELL.

To the Editor of THE LANCET.

SIR,—In reading Sir Charles Ballance's interesting historical sketch of the present position of the cancer problem, I notice that he mentions "nuclear degeneration" as characteristic of the cancer cell (THE LANCET, Feb. 16th, p. 323). After prolonged study of cancer cells in the living condition, with dark-ground illumination and with various methods of staining, I have come to the conclusion that the nucleus of an actively growing epithelial cancer cell shows no sign of degeneration. Indeed, the nucleus itself seems larger than the nucleus of the normal epithelial cell from which it has been derived.

Other facts point in the same direction. Epithelial cancer cells have a high lecithin content. Thus, if a small portion of cancer tissue be kept in a closed cell in normal saline, myelin lecithin threads are seen to develop from and around the edge of the tissue. Cancer cells show well-marked Golgi bodies. In this connexion Ludford and Cramer's observations (summarised in the same issue of THE LANCET, p. 351) on the altered position of the Golgi body in thyroid cells in exophthalmic goitre are very significant. Whatever may be the ultimate nature and origin of the Golgi body, the fact that its position and orientation in the cell give some indication of the direction of secretionary flow may have important bearings on the cancer problem. In the Mitchell Banks Memorial Lecture, and in various communications to medical journals, I have shown that epithelial cancer cells, like some normal epithelial cells, elaborate definite, and, in some cases, considerable amounts of a substance which has a very strong affinity for, and stains a mauve colour with, iodine. Although the exact composition of this iodophil substance is not definitely known, its presence in epithelial cancer cells and in *certain* sarcoma cells, as in leucocytes and some other cells, is characteristic, not of degeneration, but of cellular activity. No doubt dead and partially devitalised cancer cells can be obtained from the central portions of any cancerous tumour which show clear evidence of nuclear degeneration, but the actively growing cells at the margin, with their capacity for cell division, do not present such changes.

I notice that Sir Charles Ballance does not favour attempts to educate the lay public on the subject of cancer. We shall all agree with him in desiring the intensive education of the family doctor in all newly discovered facts which may aid him in making an early diagnosis. But our experience at Leicester, as indeed throughout the country, is that a marked reluctance on the part of patients to seek early advice is mainly responsible for the loss of valuable time. The further education of the doctor will be of little avail unless sufferers from cancer, real or suspected, can be induced to seek advice. We hope that our local cancer committee, established under the joint auspices of the municipal health authority and the Leicester Royal Infirmary, with its associated cancer control clinic, is doing something by educational methods to remove this reluctance, and thus to bring about the earlier recognition and treatment of the disease. It has, at any rate, been instrumental in dispelling from the minds of a number of persons who have sought its help, but who were found on examination to be free from cancer, that "fear and dread" which Sir Charles Ballance so rightly deplores.

I am, Sir, yours faithfully,

Leicester, Feb. 21st, 1929. C. J. BOND.

VIRILISM DUE TO HYPERNEPHROMA.

To the Editor of THE LANCET.

SIR,—We have been asked, for the sake of future reference, to give a further note on a Case of Virilism due to an Adrenal Cortical Hypernephroma. The case was reported as a successful operation for the removal of a malignant adrenal tumour in THE LANCET of Oct. 8th, 1927 (vol. ii., p. 745). At that time the symptoms had entirely disappeared; unfortunately, this satisfactory condition did not persist. In November, 1927, symptoms of virilism recurred and a mass of growth was palpable under the right rib margin; an operation showed that this tumour was quite beyond the reach of surgery, and it was decided to give the patient a course of deep X ray therapy. Death occurred on Nov. 2nd, 1928.

We are, Sir, yours faithfully,

C. G. MURRAY,

Sheffield, Feb. 24th, 1929. GRAHAM SIMPSON.

DESIGNATION OF WHITE BLOOD CELLS.

To the Editor of THE LANCET.

SIR,—More in sorrow than in anger one cannot help reflecting after reading Dr. A. T. Todd's article on a case of *Bacillus abortus* infection in the last issue of THE LANCET (p. 388) how poor indeed must be the English language if it is found necessary to borrow German words to designate the various white cells in making a differential blood count. Perhaps I am doing the author an injustice; perhaps there is a purpose behind his method. May it be that he wishes to add the last straw and break the back of the hopeless confusion which pervades hæmatological nomenclature. Is it not time that an international effort be made to clear the ground?

I am, Sir, yours faithfully,

Wimpole-steet, W., Feb. 23rd. HUGH S. STANNUS.

THE INJECTION TREATMENT OF VARICOSE VEINS.

To the Editor of THE LANCET.

SIR,—Though altogether out of sympathy with the injection method of treatment of varicose veins, I have been content hitherto to remain silent on the subject, but in view of the annotation on p. 408 of your last issue I feel impelled to do more than merely register a silent dissent from the conclusion there advanced. In this annotation it is assumed that the case for the injection treatment is now proved beyond question, and the reader is left to infer that this point of view is now generally accepted. I quote from the article :—

> This treatment is so simple, so effective, that it has ousted almost completely the treatment by operation. On the whole, it can be said that the injection methods now generally adopted are suitable for routine use. The risk is less than operation and the results are better.

This is a general statement that should hardly be made without a simultaneous presentation of the proofs upon which it is based.

As one who not merely does not believe in the injection method, but, indeed, profoundly disbelieves in it, may I say that I am prepared to accept only one part of the statement—namely, that the treatment is simple. To my mind its simplicity is one of its chief drawbacks, in that it tempts the inefficient and perhaps the less scrupulous members of the profession to carry it out too often without any, or sufficient, justification. I do not admit as proved that the method is as effective as operation in cases that really require treatment. I am not concerned with the other cases that have so enormously swelled the statistics of recent years, cases many of them that required no active treatment. Nor am I prepared to admit that it has yet been decided whether the risk of injection or of operation is the greater.

I am not desirous of initiating a correspondence on the subject, nor am I inclined to take part in any correspondence that may emerge, but in view of your article, and the assumption therein that the matter has been settled now beyond dispute, I feel that it is necessary to make this protest. I profoundly believe, and I am accustomed to teach my students, that the injection method of treatment is unsound scientifically, and therefore unjustifiable surgically. I shall be told that I am not entitled to express an opinion on the subject because I have not personally put the method to the test of trial—which is true. But I reply that I have not put it to the test *because* it is unsound, and therefore surgically unjustifiable. The avowed purpose of the method is the obliteration of the lumen of a vein by the production of thrombosis. It is my considered opinion that the deliberate production of thrombosis by the surgeon—or by anyone—is unjustifiable. Every surgeon knows of the disastrous effects of the thrombosis and embolism which occur occasionally after any surgical procedure. Can it then ever be justifiable deliberately to encourage such a happening?

I shall be told that the type of clot which is sought—and perhaps obtained—in the injection treatment of veins is different, and behaves differently, from the thrombus we fear so much in other conditions. I am not convinced that it is in any essential way different, or can be trusted to behave differently. I shall be told that obliteration of veins produced in this way is an imitation of Nature's method of cure. I am still unconvinced. And even if this be admitted, I would humbly point out that even Nature makes mistakes sometimes. Most of us could cite cases of death following upon simple thrombosis of varicose veins, with resultant embolism, where no operative procedure of any kind had been carried out. I dare to suggest that even now we have not got a full or a true record of the ill-results, and even of the fatalities that have followed upon the injection treatment of veins; but these will yet emerge. Only the other day the public press contained the account of an inquest on a fatal case of the kind, though, of course, the medical evidence made much of the comparative infrequency of such an untoward happening.

But apart altogether from actual fatalities, it is certain that there have been many more failures of cure than are generally admitted, even as there have been very many more cases of sloughing of the skin over the injected veins than the writers on the subject seem to be prepared to confess to. I have myself seen a number of these, and the resultant ulcers are nasty enough, and difficult enough to get to heal. Further, in more than one of these cases which I have seen the injection treatment had been carried out upon veins that called for no such active procedure at all. This supports the view, which I stated earlier, that the numbers of cases submitted to injection have been artificially swollen; that many quite young girls, who might happen to have an odd superficial vein, causing no trouble whatever, but perhaps showing as a bluish streak through the diaphanous silk of the modern female hose, have been able to induce someone to try to remove the offending streak by the medium of injection. Indeed, my suspicion in this direction is more than a suspicion; it is a definite conviction. I have several times been asked myself to do the deed—and have refused. In all probability someone more complaisant came to the rescue.

For these and other reasons, therefore, I wish to make it clear that there are still those—and I am one of them—who regard the injection treatment of varicose veins as an unscientific procedure, and therefore unsurgical—certainly not free from risk. It may not be out of place here to say that the same arguments as I have advanced above against the injection of varicose veins—and other arguments perhaps even more potent—I would put forward in respect of the injection treatment of hæmorrhoids.

I am, Sir, yours faithfully,

ARCHIBALD YOUNG.

The University, Glasgow, Feb. 25th, 1929.

OSTOCOPOS.

To the Editor of THE LANCET.

SIR,—There is a curious word which is found in Theophrastus (*Physica*, 7) as an adjective, *ὀστεοκόπος*, translated in Liddell and Scott as bone "shattering." It occurs in Hippocrates 396, 9, and in Galen as a substantive, which Liddell and Scott translate "a sense of weakness, as if one's bones were giving way." It next appears in Latin under the form "Ostocopos" but only twice, in Serenus Sammonicus, Cap. XLVIII., 892, and in Pelagius Vegetius, *de Arte Veterinaria* III., 10, and it is given in Du Cange's Glossarium ad Scriptores Mediæ et Infimæ Latinæ (Paris, 1688), but it only cites Sammonicus and translates it "Dolorem sentiens in ossibus." Sammonicus, who wrote about A.D. 225 in the reign of Alexander Severus, devotes a whole chapter to it, but his work has never attracted any attention in England though widely known on the continent in the seventeenth and eighteenth centuries.

I think it is clear that he is describing dengue, and this is the only description of that disease in ancient writers. He says: "Sometimes a new cause of sudden pain makes its appearance, of which the origin is quite obscure, and it must be controlled by well-established lines of treatment" . . . . "but if fever with a very high temperature (febres calidæ) waste the tissues, &c.," . . . . and, again (901), "besides which it dries up the excessive chyme in the stomach, which more and more forebodes that the tissues are done for," and he winds up by saying, "but in cases of prolonged fever fresh chicken broths made from an old cock are very useful, being restorative to limbs that show subsultus." The heading of his chapter is "On Sudden Pain and Bone Aching."

We have here a description of an acute and sudden disease of epidemic occurrence (nova causa) in which pain in the bones is the most marked symptom. The gastric symptoms in dengue are well known, "gastric oppression is urgent and vomiting may occur," Sir Patrick Manson in Allbutt's "System of Medicine," II., p. 380. Dengue has been known on the Mediterranean coasts since 1779 when it was first

recognised and must have been long known in Africa as the name is a Swahili word. It is quite possible that the disease was more fatal 1700 years ago than it is now. I am, Sir, yours faithfully,

Forest Row, Sussex, Feb. 20th, 1929. A. MAUDE.

TONSILLECTOMY IN CHRONIC ARTHRITIS.

To the Editor of THE LANCET.

SIR,—I must apologise for causing Dr. Warren Crowe to waste his time. The sentence on which he has based his calculations was never intended for more than a warning against undue enthusiasm. The "7000" was, I regret to say, a figure even more rhetorical than I realised at the time I wrote. It was based roughly on the total admissions to the Royal Bath Hospital for the six years. On the terms of the original foundation the hospital regulations allow for a fortnight's treatment. If a patient's stay is prolonged a "readmission" is recorded. For instance, in 1921 the total "admissions" were 1288; but of these 498 were "readmissions." For 1921, therefore, 730 individuals were treated; about half of these suffered from arthritis. The 7000 consequently falls to the ground—except as a caution against enthusiasm.

But Dr. Crowe refers to 7000 cases of "rheumatic disease"—a term which I suspect of being rather narrower than mine, which included all forms of arthritis, and, in addition, a large number of cases of fibrositis and neuritis. The facts, as near as I can ascertain them, are that during this six-year period 2333 cases of all forms of arthritis were admitted. Of these, 1750 belonged to the infective arthritis group, comprising:—

(*a*) Rheumatic fever and subacute rheumatism .. 245 cases.
(*b*) Specific infective arthritis.
(*c*) Focal arthritis with definite focus .. .. .. } 1470 „
(*d*) Indeterminate: focus unknown .. .. }
(*e*) Zymotic—i.e., scarlet fever, diphtheria, &c.

It is, of course, principally with these that tonsillectomy requires consideration; but, I claim, more consideration than Dr. Crowe is prepared to allow.

I am, Sir, yours faithfully,

Harrogate, Feb. 18th, 1929. A. B. PAVEY-SMITH.

THE LEGAL VALUE OF A MEDICAL REFEREE.

To the Editor of THE LANCET.

SIR,—The Laws of England provide that a judge can demand the services of a medical expert as a referee in cases where medical matters are the predominant features of a trial. As a matter of fact, the Home Office has medical experts whose evidence it calls in cases of suicide and murder. This evidence is indispensable and forms a prominent part of the problem which goes to the jury. It has always seemed to me strange that judges never seek for their personal guidance the services of a medical referee in cases of insanity, malingering, and damages claimed for medical malpraxis. The custom—were it adopted—would in no way detract from the prestige of Law nor of a judge, and it would certainly add to the dignity of his Court. It is not an edifying sight to see opposing medical experts frankly becoming advocates for their respective sides and delaying the proceedings of the Court while coaching their counsels in attempts to trick their opposing colleagues into misleading admissions. The omission to obtain the services of a medical referee sometimes leads to a negation of justice although law may be satisfied. In dealing with trials concerning navigation an expert navigator acts as referee to the judge. The failure of a judge to avail himself of the Law's provision in cases of medical and legal importance cannot be due to his greater knowledge of Medicine than of Navigation. The reason seems to me to be that Law does not yet realise the greatness of Medicine now compared to its position in the past. Other departments of State understand the overwhelming value of this science. There can be no doubt that eventually Law will be compelled to modify its procedure in the direction I have indicated when dealing with cases of combined medical and legal complexity.

I am, Sir, yours faithfully,

Harley-street, W., Feb. 25th. G. LENTHAL CHEATLE.

*** At the Bristol County Court on Feb. 19th medical evidence was heard on both sides in an arbitration under the Workmen's Compensation Act. In delivering judgment, which was limited to a declaration of contingent liability, his Honour Judge Parsons expressed the hope that (if there was a future hearing of the case) he might have the assistance of a medical assessor, as it was difficult for a layman to decide a point upon which medical experts were in conflict.—ED. L.

URÆMIA SIMULATING ACUTE INTESTINAL OBSTRUCTION.

To the Editor of THE LANCET.

SIR,—Is there not an error in Dr. Leslie Smith's and Mr. Kenneth Heritage's argument? Discussing their most interesting case of uræmia associated with acute intestinal obstruction, they say: "There is, in this case, no suggestion of mechanical interference with the urinary tract" (THE LANCET, Feb. 23rd, p. 416). I take it they are referring to the urinary tract distal to the kidney; but the question is, where does the urinary tract begin? Does it begin in the calices of the kidneys; or may the Bowman's capsules be legitimately regarded as its beginnings? In the latter case—if the uriniferous tubules may be considered as integral parts of the urinary tract—mechanical interference with parts of the tract in so far from being clearly absent in their case seems to have been clearly present. That at least must be so if the case presented the signs usual of acute intestinal obstruction—increased tonicity of the abdominal wall during the pains, common to all colics, and the marked contractions during the strainings, whether associated with the vomitings or not.

There is a good deal to be said in favour of such a view. The idea is supported by the difficulty of believing that absorption of intestinal contents (putrefactive or not) is a special feature of the obstructed gut—the evidence is that fluid is poured from the gut wall into the lumen of the gut (hence (1) the anhydræmia, and (2) the copious vomitings); and by the difficulty of believing that if intestinal poisons (changed proteins) were absorbed and caused the renal disability, the process of such absorption should so soon cease with the relief of the obstruction, as indicated by the amazingly rapid improvement in the patient's general condition and the (presumably) slower yet "dramatic" fall in blood-urea, the direct consequence of operation. This latter clearly does not suggest a toxin had been in play; on the contrary, it opposes that supposition.

Obstruction to the urinary outflow, whether caused by phimosis, an enlarged prostate, an obstructed ureter, all affect the patient and his blood-urea; nor does the obstruction have to be complete to do so. Thus, a series of compressions of the kidney, if marked enough, may quite reasonably be impugned as causal of renal aberration and to some extent at least of the oliguria (not mentioned in this case). We may perhaps go even further and wonder whether such compressions, as subtle in their play as poisons, under somewhat different physical conditions, may not be causal of that nephrosis so beloved of physicians as patently the product of indefinable and unknown toxins. I am, Sir, yours faithfully,

Rugby, Feb. 23rd. R. H. PARAMORE, F.R.C.S.

SPINAL ANÆSTHESIA IN ABDOMINAL SURGERY.

To the Editor of THE LANCET.

SIR,—Some 12 years ago I urged in your columns [1] the more general adoption of spinal anæsthesia for

[1] THE LANCET, 1916, ii., 645.

acute abdominal cases in patients of all ages, from 6 months to 70 years. It is interesting and pleasing to find this advocacy supported by Mr. McNeill Love last week in his Hunterian lecture. What preparation of stovaine Mr. Love uses he does not say, but with the 10 per cent. solution of stovaine in sodium chloride the head should be lower than the feet as from the time of injection, and a high Trendelenburg position can be adopted immediately. Using the solution named I have never been able to demonstrate that posture has any effect on the level of anæsthesia attained, and clinical findings therefore support Dr. Howard Jones's contention that spread through the cerebro-spinal fluid is by diffusion. In that paper, too, is indicated a technique for the conduct of all operations in which spinal anæsthesia alone is used, including those on the upper abdomen. It is heartening to those of us who have been ardent supporters of spinal anæsthesia for many years to find that Prof. Pannett supports its use and pleads for further consideration of this unjustly maligned method.

I am, Sir, yours faithfully,

PERCIVAL P. COLE.

Harley-street, W., Feb. 25th, 1929.

To the Editor of THE LANCET.

SIR,—I acknowledge my error in supposing that diffusion adds material assistance to gravity in the distribution of novocaine and thank Prof. Pannett for the correction.

I am, Sir, yours faithfully,

W. HOWARD JONES, M.B., B.S. Lond.

London, W., Feb. 26th, 1929.

PROPHYLAXIS OF INFLUENZA.—Dr. A. Graham-Stewart writes that the number of organisms per c.cm. in the vaccine he uses (THE LANCET, Feb. 23rd, p. 415) should have been given in *millions*, not thousands.

Public Health Services.

INFLUENZA.

CLINICAL reports from various parts of England and Wales indicate little change in the position beyond a somewhat more even distribution of the disease. Incidence is still reported high in the north-western area, particularly Manchester and Liverpool, although decrease is admitted in the latter place. Prevalence increases, if not at the previous rate, in London and the home counties. Elsewhere in the country the epidemic is widespread except in South Wales and Bristol, where it appears definitely to have declined. Sheffield, which has hitherto been reported free, is now affected; Nottingham and Stoke-on-Trent, where some incidence was reported at the outset of the epidemic and which were subsequently reported free, are now again stated to be affected. The disease is reported generally to be mild, although otorrhœa is mentioned as a complication in the Manchester district.

On the Continent the epidemic is abating except in certain towns of Western and Southern Germany and some parts of Spain.

THE LOCAL GOVERNMENT (SCOTLAND) BILL.[1]

THE Local Government (Scotland) Bill, having got through the Committee stage in the House of Commons on Feb. 25th, emerges with certain important new features. One of the most interesting new clauses is that which deals with the treatment of the sick and with hospital organisation. For the first time sickness is to be separated from the poor-law and the distinction between poor-law patients and public health patients is to disappear. County and town councils are given the power to submit schemes for reorganising the hospital facilities at their disposal so as to provide treatment for sick persons in their area. These schemes will go to the Department of Health for Scotland (as we must now call what we used to know as the Scottish Board of Health) for approval, the Department being directed to have regard to any other facilities for treatment "including those provided by any voluntary hospital or other institution." Some comment was evoked by the fact that the clause is not mandatory, but permissive. The Government spokesmen explained in reply that elsewhere in the Bill (in what was clause 50) the Secretary of State for Scotland, if satisfied that a council has failed to achieve or maintain a reasonable standard of efficiency in the discharge of its public health functions, can reduce its grant. But this is, of course, neither so peremptory nor so prompt a method. In addition to the submission of schemes as already mentioned, there is power under the new clause for the councils to represent to the Department that their available hospital facilities are inadequate for the reasonable requirements of the area and to submit schemes for extending existing facilities. In that event the Department, before approving such extension schemes, has to be satisfied that the council has taken "reasonable steps to seek and to continue to secure full coöperation with every voluntary hospital, university, or medical school within or serving the area of the council." Where the Department has approved either kind of scheme, the county or town council may accordingly "provide, furnish, and maintain, for the accommodation of sick persons residing within their area, hospitals temporary or permanent and houses of reception for convalescents," and for this purpose may either themselves supply the accommodation, or may contract for the use of it, or agree with the managers of existing accommodation on payment, or utilise any hospital, house, or other buildings already possessed by the council. Another important new clause is that for the recovery of expenses of treatment. Under the old law the poor-law authority could recover expenses if the supposed poor person had some money put away somewhere; it is not unreasonable to put all the hospitals under the new arrangements upon the same basis. There remains presumably an exception for infectious disease since it is usual to remove the infectious case to a special institution under an almost compulsory power for the protection of the community. Objection was raised that demands may be made in maternity cases which may be deterrent to the patient and which are in contrast with the free treatment given for venereal disease. The clause, however, got its second reading without a division and was not altered in Committee.

The general position of the proposed reform of Scottish local government may be summarised as follows: The original idea was to abolish the parish councils and transfer their functions to the bigger reconstituted authorities. As in the English parallel, there was naturally an objection that the great merit of the parish councils was the maintenance of local touch in administration. The Government then brought in a new clause to set up district committees for landward county areas. The new district councils will contain the local county councillors and other elected representatives of the local area. The new county councils will be allowed to delegate certain functions under approved schemes; it will be interesting to see where outdoor and indoor relief administration will respectively be allocated in consequence. There will naturally be much sentimental regret at the disappearance of the old parish councils in Scotland, bodies very different from the parish councils in England. There is gradually being evolved a new system of local government for both countries on

[1] The discussion on the Bill in Committee of the House of Commons is reported in our Parliamentary columns.—ED. L.

roughly parallel lines. On the whole the reception of the Scottish proposals by those from whom criticism was expected seems by no means unfavourable.

MENTAL HOSPITAL REPORTS.

SOME SCOTTISH HOSPITALS.

WE welcome the appearance of the reports of the *Crichton Royal Institution, Dumfries*, and the *Glengall Hospital*, at *Ayr*, for the full year 1928. They are the first of their kind to reach us, commendably early in 1929. On Dec. 31st last there were 1043 patients in the Crichton Hospital, an increase of 53 during the year. Of these, 297 were on a voluntary basis. There were 106 more patients admitted during the year than the average number, so the staff had a busy time. During the year 459 voluntary patients were under treatment, and only two of them had to be certified. The increase in the number of voluntary boarders was especially marked among private patients. The majority were middle-aged people who had not previously had a mental breakdown. The recovery-rate was 25·5 per cent. of the voluntary and 23·5 per cent. of the certificated cases. The death-rate was 7·3 per cent., and the general health was satisfactory, except for three cases of scarlatina among the nursing staff. A new reception hospital was opened in November, and in May an arts and crafts pavilion was inaugurated to expand and improve previous arrangements for occupational therapy. An occupational instructress has been appointed, in addition to the supervisor of outdoor occupations and recreations, who has been at work for ten years. The grounds supplied the institution with vegetables, fruit, and flowers, and the farm had a successful year. One hundred patients had parole outside the grounds, and just over a hundred within them. The famous rock garden, laid out four years ago, already contains more than 2000 named specimens. Twenty-two nurses and five attendants obtained their M.P.A. certificate during the year, four with distinction.

The Glengall Hospital at Ayr had 605 patients on its books at the end of the year, 12 of these being on a voluntary basis. More than a quarter of those admitted were in a precarious state of health physically. That the type of case sent to the hospital has greatly deteriorated since the war is proved by the fact that, in spite of a comparable average admission rate, the average death-rate, which was 36 per cent. from 1909–13, has risen to 55 per cent. between 1924 and 1928. This means a lower recovery-rate and greatly increased work for the nursing staff. The recovery-rate for the year was 31·5 per cent. and the death-rate 15·7 per cent.—the highest on record. Procrastination in seeking treatment is declared by the medical superintendent to be largely responsible for the increase. General paralysis heads the list of causes of death despite modern methods of treatment, and there were 12 deaths from tuberculosis. Autopsies were held on 88 per cent. of cases. Apart from debility, the general health was good. Occupational therapy has been initiated, and—apart from bedridden patients—only 36 patients were unoccupied at the time of the Commissioner's visit. Their work was chiefly in the grounds or laundry, but a certain number assist the artizans in the workshops. Arrangements are at last to be made for dental care. The hospital now has 48 per cent. of its staff fully trained and certificated, four nurses and five attendants having obtained their M.P.A. certificate during the year.

The report of the *Stirling District Board of Control* for 1927–28 shows that on May 14th last there were 943 certified and 25 voluntary patients in the mental hospital at *Larbert*, an increase of 59 during the year. In addition, there are 88 patients in the lunatic wards of poorhouses, 83 boarded-out cases, and 155 mental defectives. The committee notes that, since the hospital was opened in 1869, over £200,000 have been spent on it. The capital expenditure was met by mortgages, and the assets vested in the district board now greatly exceed the balance of mortgages still outstanding. Of the 23 voluntary patients admitted during the year, 13 were chargeable to parish councils, reminding us again of the advantage Scotland has over England in the treatment of early mental disorder among the poorer classes. The recovery-rate was 37·35 per cent.; 49 patients were discharged recovered within six months of their admission, and one case of melancholia left recovered after eight years; 16 patients were sent out on trial, and only one had to return. The death-rate was 8·2 per cent., and the cause of death was verified by autopsy whenever permission could be obtained. Except for mild influenza, the general health was satisfactory. Electrical and ultra-violet ray treatment have proved beneficial for many patients, and the X ray apparatus was used diagnostically in 33 cases. The health of a large number has shown improvement as a result of the systematic attention given to their mouths and teeth by the dental surgeon, who visits weekly. During the year he extracted 1036 teeth and filled 120 more. Only eight patients had healthy mouths, and very many had acute gingivitis. The occupation department employs a great number in various handicrafts, and special attention is paid to those whose symptoms and habits preclude other forms of employment. Others have worked in the grounds, which supply the institution with flowers and vegetables. The wet, dull weather spoilt the year for the farm, but the crops were secured in fair condition. Sixteen nurses and 11 attendants obtained their certificate during the year, bringing the total to 45.

On May 16th, 1928, there were 729 persons in the *Inverness District Asylum*, the steady increase of the last four years being maintained. The increase in population is not due to an increase in the admissions but to the large proportion of incurable permanent cases. This has meant considerable difficulty in finding suitable accommodation; no less than 47 of the women are more than 70 years old and in need of constant nursing care. The recovery-rate of 34·8 per cent. is therefore a high one. Nineteen patients went out on probation during the year, of whom one returned. The death-rate of 7·8 per cent. is a great improvement on last year. Phthisis and senile decay were responsible for half the deaths. Twelve autopsies were held. The nine patients suffering from phthisis are nursed in the open air. The grounds and buildings gave employment to 446 patients, but there is no occupational therapy department. Apart from a shortage of milk, the supply of farm produce was very satisfactory. Eight nurses and four attendants obtained their M.P.A. certificate. The report includes an interesting summary of the structural history of the asylum since 1864, and a list of the certificated nurses. There must be very few institutions that still retain the name "asylum," which has unfortunately acquired an evil connotation in the public mind.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 16TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 231; scarlet fever, 1966; diphtheria, 1169; enteric fever, 37; pneumonia, 3658 (last week 3898); puerperal fever, 41; puerperal pyrexia, 99; cerebro-spinal fever, 19; acute poliomyelitis, 4; acute polio-encephalitis, 2; encephalitis lethargica, 25; dysentery 2; ophthalmia neonatorum, 108. No case of cholera, plague, or typhus fever was notified during the week.

Counties reporting large numbers of cases of pneumonia are as follows: London, 562 (last week 689); Chester, 173 (172); Durham, 168 (133); Essex, 167 (136); Lancaster, 906 (1102); Stafford, 113 (153); Warwick, 131 (132); Yorks West Riding, 296 (292)—from which it will be seen that the incidence generally is on the down-grade.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Feb. 19th–20th was as follows: Small-pox, 39 under treatment, 6 under observation; scarlet fever, 1815; diphtheria, 2000; measles, 51; whooping-cough, 932; puerperal fever, 18 (plus 4 babies); encephalitis lethargica, 80; poliomyelitis, 5; "other diseases," 60. At St. Margaret's Hospital there were 10 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 77 (0) from measles, 9 (1) from scarlet fever, 229 (80) from whooping-cough, 48 (8) from diphtheria, 48 (10) from diarrhœa and enteritis under two years, and 1243 (393) from influenza. The figures in parentheses are those for London itself.

The number of deaths from influenza during the previous eight weeks was 69, 83, 99, 122, 179, 321, 652, and 987 respectively, the figures for London during the same period being 9, 15, 18, 34, 39, 77, 198, and 331, from which it is seen that the rate of rise has moderated in London as elsewhere. In the week under review deaths were attributed to influenza: Manchester, 119; Leeds, 56; Liverpool, 46; Salford, 34; West Ham, 33; Middlesbrough, 31; Birmingham, 29; Bolton, 25; St. Helens, 20; Stoke-on-Trent, 19; Oldham, 18; Norwich and Croydon, each 17; Portsmouth, 16; Ealing and Leicester, each 14; Walthamstow and Stockport, each 12; Birkenhead, 11. No other great town had as many as 10. (Glasgow reported only 33, Edinburgh 68, and Belfast 41.) Liverpool reported 21 deaths from measles, Sunderland and Cardiff each 9. Deaths from whooping-cough were reported from Manchester, 23; Salford, 14; West Ham, 11; no other large town more than 10, but the deaths were widely distributed.

The number of stillbirths registered during the week was 314 (corresponding to a rate of 54 per 1000 births), including 52 in London.

Death-rates from Influenza for the Last Quarter.

The death-rate from influenza in the different parts of the country is set out by the Registrar-General in a comparative table of figures since December, 1928.

Week ended—	Aggregate.	North.	Midlands.*	South.*	Wales.	Greater London.
Dec. 8th, 1928	0·16	0·20	0·20	0·12	0·13	0·10
,, 15th, ,,	0·16	0·19	0·12	0·32	0·20	0·14
,, 22nd, ,,	0·18	0·23	0·16	0·28	0·20	0·11
,, 29th, ,,	0·22	0·29	0·19	0·24	—	0·17
Jan. 5th, 1929	0·26	0·26	0·29	0·36	0·20	0·26
,, 12th, ,,	0·32	0·35	0·43	0·28	0·33	0·27
,, 19th, ,,	0·47	0·52	0·44	0·80	0·27	0·38
,, 26th, ,,	0·85	1·05	0·36	1·52	0·47	0·81
Feb. 2nd, ,,	1·73	2·14	0·48	2·56	0·53	1·89
,, 9th, ,,	2·56	2·96	0·77	2·64	0·80	3·20
,, 16th, ,,	3·29	3·54	1·84	2·00	0·94	4·34

* Excluding Greater London.

The figure is the number of people per 1000 of population who would die in a year if the death-rate of the week in question were to persist for that period.

DONATIONS AND BEQUESTS.—Mr. Edwin Norton, Great Central Hotel, Marylebone, London, and formerly of Mansfield, Weybridge, left £2000 to St. John's Institution for the Deaf and Dumb, Boston Spa.—Mrs. Eliza Jane Briggs, Bowdon, Cheshire, widow of Thomas Briggs, an ex-Lord Mayor of Manchester, left about £30,000 to Manchester Charities, including, among other bequests, £2500 to the Manchester Royal Infirmary, £2000 to the Altrincham General Infirmary, £1000 each to the Manchester and Salford Hospital for Skin Diseases, and to St. Mary's Hospital for Women and Children, Manchester; £500 each to the Manchester Children's Hospital, Pendlebury; Henshaw's Blind Asylum; the Northern Counties Hospital for Incurables, the Adult Deaf and Dumb Institution, Chorlton-cum-Hardlock, and the Manchester and Salford Branch of the Society for the Prevention of Cruelty to Children. The residue of the property, about £16,000, goes to the East Lancashire Home for Disabled Sailors and Soldiers, Park-lane, Broughton.—Mrs. Lucy Greene, of Bydinghurst, Cranleigh, left large bequests for charitable purposes, including £8000 to the Lebanon Hospital for the Insane, £5000 to the National Society for Epileptics, Chalfont St. Peter, and £500 to St. Dunstan's Hospital.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT (SCOTLAND) BILL.

THE House of Commons went into Committee on the Local Government (Scotland) Bill on Wednesday, Feb. 20th. Mr. J. F. HOPE, Chairman of Committees, was in the chair.

Failure to Discharge Functions.

On Clause 25 Major ELLIOT (Under Secretary of State for Scotland) explained that the clause provided that where the Scottish Department of Health were satisfied after a local inquiry that a town council of a small burgh had failed to discharge their functions with respect to the provision of water-supply, drainage, or housing, the Department might authorise another authority, such as the county council, to discharge those duties. It was, however, only reasonable that this overriding power should apply both ways, and he therefore moved an amendment providing that if a county council were in default the particular duties in that area should be taken over by another authority—possibly the burgh authority.

Mr. STEPHEN moved an amendment to the amendment making it mandatory on the Department of Health to order in the case of default by one authority that the duties should be undertaken by another body.

Mr. WATSON (Lord Advocate) opposed the amendment. The view of the Government was that there might be cases where the local authority might be justified in maintaining for a time that there was no failure on their part. An inquiry might substantiate a different view taken by the Department. It would be a wise arrangement that the Department should be enabled in such circumstances to give the defaulting body time to put the matter right.

The amendment to the amendment was rejected by 196 votes to 86.

On Clause 26 (the county medical officer of health and the sanitary inspector to act for small burghs),

Mr. W. ADAMSON moved an amendment to provide for the continuance of

Whole-time Sanitary Inspectors for Small Burghs.

He said if the control of this work passed into the hands of the county councils a county council might appoint a sanitary inspector for the whole of the county. That would be a retrograde step and might have serious consequences. He knew a number of small burghs where there was plenty of work for a full-time sanitary inspector if the health of the people was to be properly attended to.

Sir R. HORNE said that he agreed that it might be a proper thing for a medical officer of health of a burgh to be the county medical officer of health also, because the latter was an appointment with wide ramifications and a medical officer employed a large number of people under his guidance to deal with questions of health in the county. But when they came to the question of sanitation in any particular district it seemed to him that they were dealing with a business which was purely local. When they considered the sanitation of a small burgh there was obviously enough work for any one man to do. He therefore thought that the question of sanitary inspection should be excluded from the clause.

Sir R. HUTCHISON, in supporting the amendment, said they were looking forward to better sanitary conditions in Scotland. The well-being of the burghs, especially the industrial burghs, depended very largely on the supervision and activity of the sanitary inspector in pointing out defects and preparing the way for improvement.

Major ELLIOT asked the Committee to consider the actual figures. Of 179 small burghs in Scotland 26 had appointed the county officer to act for them, 106 had full-time officers, and 47 had part-time sanitary inspectors. He asked hon. Members, and particularly his medical colleagues in the House, to consider the position of a sanitary inspector. That position was growing more difficult than it was a few years ago. It was becoming a more and more technical and highly skilled appointment. It was of great importance to get whole-time skilled men into these important posts. Some of the correspondence which the Board of Health had had in recent years showed that some of the smaller burghs did not by any means rise to the modern conception of good sanitation. They had done their utmost for years to raise the status of the sanitary officer and to make it clear that the position was not less important, but in some ways more important, than that of the medical officer of health. They had done their utmost to secure that the officers appointed should be holders of the sanitary inspector's certificate of the Royal Sanitary Association of Scotland. These were posts which it was much more suitable to be held by whole-time officers, but they found that in practice the

appointments had not been whole-time appointments. He urged the Committee to address itself to the important matter of public health and not to be deterred by the question of the prestige of this or that local authority. There would be no disturbance of existing appointments and nothing would happen until one of the appointments became vacant, when in the view of the Government it ought to be filled by a man of high qualifications who would devote his whole time to the work.

Mr. JOHNSTON said the Under Secretary continually proceeded on the assumption that the initiation, control, and administration of public health in the small burghs was not so efficient as in the counties. Where did he get warrant for that? It was not in the public health statistics nor in the death-rate. They had a lower infantile mortality in the small burghs than in the counties. It was only when they got to the higher ages that there was a lower death-rate in the counties; yet the counties ought to be healthier than the burghs. He had spent many years on all forms of local government in Scotland, and he believed that the step proposed in the Bill was a retrograde one in regard to public health. He would give one illustration. Two years ago in many parts of the country the control of milk and dairies was taken away from the small burghs and handed over to the counties. When the burghs did the work inspections were held at least four times a year. Now under the county councils at most inspection took place twice and in some places only once a year.

Captain FANSHAWE supported the amendment. For the present at any rate they should leave the sanitary inspectors of the small burghs under the entire control of those people who had been elected to look after the affairs of those burghs.

Mr. WATSON (Lord Advocate) said that the desire of the Government was entirely for the improvement of the health of the people and of the sanitary administration of these districts. They did not wish to throw any aspersion on the many admirable instances of burghs which were working satisfactorily at present. He was perfectly willing if the amendment was not pressed at this stage to reconsider the question in the light of the debate which had taken place.

Dr. DRUMMOND SHIELS said that the form of the amendment showed that it was not put forward in any obstructive way. The question of the appointment of the medical officers of health had not been traversed at all, although they realised that many burghs in Scotland would be reluctant to depart from the system of having their own medical officers and undoubtedly many of those officers had done and were doing excellent work. Undoubtedly it was the modern trend in public health to have larger administrative areas for the medical officers of health. But as regarded sanitary inspectors the position was quite different. He agreed with Major Elliot that a sanitary inspector with a multiplicity of posts was not desirable. In some of the smaller burghs where that was the position no doubt the work could be more suitably done by the county officer. On the other hand, it was ridiculous to say that other burghs had not sufficient work to occupy a full-time and highly-qualified officer. He suggested that in reconsidering the matter the Government should take into account the question of whether at least burghs with a population of 10,000 and over should not be allowed to retain the privilege which they now had of appointing their own official to look after their own sanitary requirements.

Mr. W. GRAHAM suggested that the Government would do much better to agree to the amendment and not leave the matter to be discussed on the Report stage which might under the operation of the guillotine resolution be impossible.

Mr. WATSON said that the Government were willing not to oppose the amendment at this stage on the understanding that there would be no breach of faith if it was found necessary to reverse the decision later on.

The amendment was agreed to on this understanding.

Freedom of Choice.

Sir R. HAMILTON moved the first of two amendments which were designed to leave freedom of choice to the burgh in the appointment of a medical officer of health.

Major ELLIOT said that the majority of Members on both sides of the House were agreed that these appointments should follow the course laid down in the clause. It was following out the practice of tradition and the development of public health work in Scotland. It had been done in over 100 cases. It would be an unworkable and retrograde step to accept the amendment.

Dr. SHIELS said that he regretted that he could not support the amendment as he sympathised a good deal with the enthusiasm and the spirit which was expressed by those who supported it. The amendment, however, was not practicable and would not work. If a medical officer was appointed for a county and individual burghs were to have a right to refuse his services and to make another appointment the very greatest difficulties would arise. The burghs which objected might not be the most suitable ones to have a medical officer of their own. They saw with regret the passing of the medical officer of health of the smaller burghs because he had been a local figure of great importance and interest, and in many cases these men had done magnificent work. But they must face the fact that, with the advance of medical science, in order to deal properly with public health matters they must have such laboratory and scientific equipment as the small unit was really unable to furnish. In the interests of the people themselves in the smaller burghs it was important that they should have available the very latest resources of science in medicine and the full equipment associated with these. The Board of Health in Scotland had always in medical matters been up to date and progressive. They would not, he was sure, be averse from taking advantage of the reservation in the clause allowing for a burgh medical officer of health where it was appropriate that a burgh should have a medical officer of its own.

The amendment was rejected by 233 to 43.

On Thursday, Feb. 21st, the House again went into Committee on the Bill with Mr. HOPE in the chair.

Discontinuance of Grants.

On Clause 37 Mr. E. BROWN moved an amendment with the object of excluding from the operation of the block grant system the health services and road grants. He said that there was no single issue raised in the Bill which was raising more disquietude in the country than the change over as regarded health services to the block system. He proposed to leave out from the block system the maternity and child welfare grant for Scotland, amounting to £157,000, the grant for tubercular treatment, amounting to £347,000, the grant for venereal disease treatment, amounting to £66,000, the grant for the welfare of the blind, amounting to £20,000, and the mental deficiency grant of £76,000, making a total of £667,000 with the road grant amounting to £280,000. The Government had already decided that the Government's plan for merging all the public health services under one control in order that they might obtain team work against disease or in maternity would be hampered by the application of the block system to those services. The Government would find that it would be hard to shake that view. The proposal of the Government was that in place of the percentage arrangement previously in operation there should be a fixed sum to be included in the general grant. That sum would have no relation to the actual expenditure on any one of these particular services. Further, that sum would be fixed once and for all on the moneys expended in the standard year. That was one of the worst elements in the proposal. Let them put it as high as they could and grant that this was a great idealistic conception—which he believed it was—in order more fully to organise the medical services and enable more whole-time medical officers of health to be appointed because of the wider area and the greater concentration of the services. How foolish it was then to risk the efficiency of their new organisation by departing from the system of grants which by general consent had worked in the direction of increasing and developing the services. The worst effect of the application of the new system would be that, so far from drawing together all those who were in favour of the expansion of the health services as a band of brothers who desired to help each other in the great work of preventive medicine, it would set up a competition among idealists which would mean that one would want more money for tuberculosis treatment, another for maternity and child welfare, and another for the treatment of venereal disease, and it would leave local authorities with a very grave burden, or change of burdens and with the temptation that these moneys might be used for other local needs. He believed that such a system would hamstring the Government's own scheme for the concentration and better working of the medical services.

Major ELLIOT said that Mr. Brown had undoubtedly raised one of the major issues of the whole Bill. It was not a party issue, but was one which would confront governments of successive complexions for many years to come. Fiscal problems were undoubtedly going to be more and more important as time went on. The system of assigned revenues had been tried and had obviously broken down because of the delocalisation of finance. In the modern industrial State with the local revenues derived from rates one particular place it was no longer possible to apply that system. They all agreed that the Exchequer, the great financial engine of the State, must be brought into play to raise a great portion of the revenues which the local authorities were to expend. The scheme of the Government in this instance was not a stereotyped grant, but was subject to the revision of experience. They had adopted the method of a grant based first of all on compensation, secondly a weighted population, a very important factor, thirdly a permanent increase in the rateable value for every

area in the country and in addition a substantial sum of new money. Further than that there was a guarantee of an increase in successive periods if and when local expenditure increased. This sum was now to be revised in a three-year period. Mr. Brown could not seriously ask them to believe that within a three-year period not only would the whole of the new money have been eaten up, but that the local authorities would be pushed so far against their financial limitations that it would cramp and cripple the new social services which they were anxious to expand. He claimed that the Government's proposal in regard to the health services was reasonable for this reason. The principle of percentage grants had worked in many cases satisfactorily, but in other cases it had not done so. There were large areas to-day which had no child welfare schemes at all. The Central Department had no power at present to enforce schemes and the local authorities had no money with which to put schemes into operation. The Highland counties would receive a sum of over £80,000 a year under this proposal and the Government would have power to call for the institution of such services. The scheme provided the cash and the necessary compulsion, but he did not believe that compulsion would be necessary. Local authorities in the past had not hesitated to develop their health services under the poor-law, even though those services were not attracting Government grants. From his experience he had learned that the long-continued and developed health policies of the great health authorities were not deflected one way or the other by the casual offer or even the continuing offer of a percentage grant. They depended on far more stable and permanent things—on the health conscience of the community, on the will of the electorate, on the enlightened health administration of the local authorities, and those authorities ought to be left as free as possible vis-à-vis the central authority. The central authority should do its utmost, as would be the case under this Bill, to see that the local authority covered a sufficient area and had sufficient resources to plan and develop such policies. In the past they had found this problem a most difficult and intractable one. He did not pretend that this solution was perfect, or that it would not need to be revised, but he contended that it laid down broad general lines upon which national and local development could take place.

Mr. W. GRAHAM said that no Royal Commission or other body which had examined this problem had recommended the scheme which the Government now proposed to apply to Scotland. If they were in fact providing for expansion in vital public health services why not leave the percentage grant system alone? It would give true expansion and they could make it more efficient. If the Government passed this clause in the years ahead it would be revised, altered, and probably abolished.

Mr. JAMES STEWART said he hoped that even at this late hour the Government would consider doing away with the block grant so far as maternity and child welfare was concerned.

Dr. SHIELS said that a very simple test in this matter was to ask whether the first impulse for a change came from the medical authorities in the public service or from the finance department of the public service. He thought that no medical authority would have pleaded for a change from the percentage to the block grant system. The change in the system with regard to public health had quite obviously been made because those services were the fast developing services. In many cases they had doubled and trebled in amount since they were instituted. The harm that would be done by the block system had no doubt been modified by the substitution of three years for five years as the period before the first revision. That would enable adjustments to be made, but even that modification had only been granted after very strong pressure by the local authorities. He was particularly interested in maternity and child welfare, and there was a very special case for those services being favourably considered. Very great and general public interest had been aroused in the question of maternal mortality. It was not easy to allocate the causes of that mortality, but one thing had been definitely settled, and that was that antenatal supervision of the mother did very definitely lessen the maternal death-rate. An adequate antenatal service in every centre of population was absolutely necessary. In Edinburgh, Glasgow, and other cities there was a fairly good service, but even in those centres the number was not sufficient, while the accommodation and comfort of them was very far from being what it should be. In other places things were worse. He wanted these places to be such that women would go willingly to receive the treatment and attention that would mean so much to them at a later date. The last few years had been economy years for the public health committees of the town and county councils of Scotland. In Edinburgh they had been contemplating a scheme for debilitated children which was to cost about £25,000. He understood that it was very uncertain now whether that would go on, because obviously this last had been the standard year, and any expenditure over and above that standard year for the next three years would fall on the ratepayers. The new money was not likely to be nearly adequate to meet the developments that would normally have taken place under the percentage system. Though tuberculosis was not assuming the proportions which it once did it was still a very serious scourge, and there were by no means too many beds available in Scotland for patients. There were in the slums and tenements far too many consumptive people who were a danger not only to themselves, but to the whole community. The treatment of venereal disease was specially endangered under this block grant. It was an unpopular service and one which got previously 75 per cent. from the State instead of 50 per cent. Therefore the local authorities would now have to find 100 per cent. instead of only 25 per cent. The blind were at present a very neglected section of the community. They were fearful, and he thought rightly so, that under this new arrangement they would have rather cursory treatment from some of the local authorities. The mental defectives service was one in regard to which they needed a very great advance. Anything based on the standard year would be obviously inadequate. It seemed to him that they had never yet realised the stupidity of educating these defective children up to the age of 16 and then throwing them out into the world a danger to themselves and to the community just at a time when they need most attention. He felt that on the basis of the standard year any advance in the treatment of mental defectives was unlikely to accrue. There was no place in Scotland where the health services, however good they were, were completely adequate to the needs of the community. The public conscience was more alive than it used to be in regard to health matters, and there was not only a great need, but also a great demand for these public health services which ought to go on and develop. It seemed to him that the argument of Major Elliot that the poor-law health system, in spite of lack of grants, had developed to a high state of efficiency, was not one that could be justified looking at Scotland generally. If the Government were really unable to accept this amendment he pleaded very strongly that at least they should make one exception and remove the maternity and child welfare services from the operation of the block grant.

After further debate,

The amendment was negatived by 174 votes to 102.

Dr. SHIELS moved an amendment to exempt maternity and child welfare from the clause.

The amendment was negatived by 181 votes to 106.

On Friday, Feb. 22nd, the House again went into Committee on the Bill. Mr. D. HERBERT was in the chair.

Contributions to Voluntary Associations in Respect of the Welfare of the Blind and Mental Defectives.

On Clause 48 Dr. SHIELS moved the following new subsection:—

"The Central Department may, before the beginning of each fixed grant period, make a scheme providing for the payment by county councils and town councils of large burghs specified in the scheme of such amount as may be specified in the scheme to the central council or committee of an approved organisation which provides services in the nature of general publicity, and educational propaganda in furtherance of the prevention and treatment of venereal diseases."

He said that the amendment was to add to the possible schemes already indicated in the clause one in regard to venereal disease. Those who were interested in public health were a little apprehensive as to the effect of this Bill on many health services and specially venereal disease. The proposal to drop the grants which had previously been given for propaganda was very unwise. Last year the House decided that the voluntary system was sufficient. His own feeling was that a purely voluntary system would not be effective in stamping out the disease, but however that might be, all who understood the subject were agreed that the voluntary system could not succeed unless the public generally understood and realised the seriousness of these conditions. A great deal of the work in hospitals was really in origin related to this subject. A similar amendment was put forward in connexion with the English Bill, but the Minister of Health did not find himself able to accept it. A very important alteration had been made in the present amendment by substituting the word "may" for the word "shall." It would now be within the discretion of the Minister to make such a scheme if the attendance at the clinics or the number of defaulters was such as to make it in his opinion desirable. A committee in Scotland had been carrying on this propaganda since 1921. It was a committee of the British Social Hygiene Council. The committee had been carrying on very important work by lectures, advertising and distributing literature, particularly in those areas where there had been a lack of interest and where cases were not coming forward to the clinics. The

Scottish Board of Health had been in the habit of giving a grant of £1000 a year for the work, and in view of the statements that were sometimes made as to the value or otherwise of propaganda he would quote the following passage from the Report of the Scottish Board of Health for 1927 :—

"Propagandist and Educational work.—The former of these provisions the Board has left in the hands of the Scottish Committee of the British Social Hygiene Council, being well assured that that body could and would do the work as well as it was possible for it to be done, and content, therefore, to stand by approvingly and render the necessary financial aid. That the work of the Scottish Committee has been effective and of high value is certain, but we learn from time to time with some surprise that information regarding these ailments, their nature and treatment, and regarding the existence of clinics where efficient and confidential treatment is available without charge to all, and, at least to the great majority of city and town dwellers, reasonably acceptable—that this information, actively disseminated as it has been for six or seven years, has not as yet by any means found its way to the whole of the population. At the male venereal disease clinics it is no uncommon experience to hear, in answer to the medical officer's question, 'Why did you not come here sooner?' the remarkable reply, 'I did not know that there was such a place.' In the female clinics such an assertion of ignorance is still more frequent; and at the latter, in addition, there is often revealed an almost incredible ignorance with regard to the manifestations of one or other of the maladies in question, or even as to the nature and significance of general indications of ill-health."

He felt that this work was national and should be done by a national department, but as the Government were not likely to agree to that he suggested that this voluntary body composed of many able and well-informed people which had been doing such effective work should be allowed to carry on, or else that some similar body should have the task of enlightening the public as to the great importance of these diseases. Those who were in charge of the treatment of venereal disease in Scotland were satisfied that if things were left as they were in the Bill local authorities would not voluntarily contribute to the funds of such an association. He hoped, therefore, that the Government would consent, especially having regard to the optional nature of the amendment, to ensure a continuance of the system which had secured at least an effective method of disseminating information regarding these diseases throughout Scotland.

Major ELLIOT said that he had done his best to address himself to the amendment from a non-party point of view, because there was undoubtedly much to be said for the arguments which had been advanced that the propaganda with regard to this disease was of vital importance and that in many ways it was better exercised from a central than from a local body. There were, he thought, conclusive difficulties against adopting the course of compelling local authorities to contribute towards the funds of voluntary associations. But the very fact that local authorities had sympathetically approached himself and other members showed that there was a feeling of full responsibility among health authorities as to their duties in connexion with propaganda work. There was a great danger in specialising one or two activities or a group of activities concerning which the local authorities must make payments. He thought that the matter would be much more readily met by a method which he would propose to the Committee. It was that in the first place the present grant from the central authority to this voluntary society should be continued. That would run up to May, 1930. He was prepared to recommend that a substantial additional sum should also be obtained from the Treasury—and he did not doubt that he would be able to obtain it—towards the expenses of this voluntary society. That would give a considerable time for those concerned to look round. He was also prepared to say that he would call a meeting of the local authorities particularly concerned in the matter and discuss the subject frankly with them. He had no doubt that they would be able to come to an agreement with the local authorities as to the health propaganda work which they desired to carry on. He did not desire to impose on the central department further powers to compel local authorities by fiat to expend sums out of money which they rightly regarded as their own money and their own responsibility. The position of the society would be safeguarded for this year and during that time the local authorities would have considered the position in regard to health propaganda and publicity.

After further debate,

Major ELLIOT said that he would undertake to convey the views expressed by hon. Members to the Secretary of State for Scotland, but he could give no pledge. He would discuss with his right hon. friend the general question of health propaganda. It must be clearly understood that they were not suggesting any payment or guarantee of payment to any single voluntary organisation or in respect to any particular disease barring the additional sum which he had already mentioned—namely, the sum in consideration of the change in the operation of the grant which was now taking place.

Dr. SHIELS said that he thought they could discern in Major Elliot's speech at any rate a sympathy with the objects of the amendment. He would therefore ask leave to withdraw his amendment.

The amendment was by leave withdrawn.

On Monday, Feb. 25th, the House again went into Committee on the Bill, with Mr. DENNIS HERBERT in the chair.

Reorganisation Schemes.

Mr. MACROBERT (Solicitor-General for Scotland) moved a new clause to enable local authorities to submit schemes for reorganisation with a view of removing the distinctions between poor-law patients and the public health patients, and to provide for hospital treatment under the public health authorities and not under the poor-law. He said that in the clause there were safeguards with regard to the voluntary hospitals, and one of the objects of the clause was to secure coöperation between the public authorities, the voluntary hospitals, and the medical schools. The schemes for reorganisation had to be submitted to the Secretary of State for Scotland by the various authorities, either county council or borough council. A wider definition was given of the words "hospital facilities." Power was given to the authorities to spend money in extensions where the present facilities were inadequate. The department would satisfy itself with regard to an appropriate scheme by inquiry, not necessarily by a formal or local inquiry. In the event of a scheme not being approved in terms by the department they might modify or amend it. Statutory powers were given to the authorities in connexion with general hospital services. At present they only had statutory powers in regard to hospitals for infectious diseases. The statutory powers were to extend to general hospital facilities in the same way that they now extended to the infectious diseases hospitals. Authorities were given power to give hospital services for people living in another area.

Mr. STEWART urged that it should be made obligatory on every county council and town council to prepare a scheme for the consideration of the central department.

Lieut.-Colonel MOORE said he represented some of the most progressive seaside towns in Scotland. In the arrangements made for a very large summer population hospital accommodation was very prominent. In certain cases the town councils had established very fine hospitals for fever and other cases and out of the rates they had practically paid off the entire capital cost incurred in building and equipping the hospitals. Under this new clause these hospitals would be taken over by the new county authorities and as far as he could see no question of compensation arose.

The CHAIRMAN pointed out that Colonel Moore could not raise that question at that point, as it came under Clause 6.

Colonel MOORE said that in that case he would ask the Government to bear in mind that there was a feeling that these towns should be compensated for the capital expenditure which they had incurred in respect of their hospitals.

The Labour View.

Dr. SHIELS said that the Labour Party agreed with the main principles of the clause, but there were certain features which they would like to see altered. In the larger industrial districts in Scotland and England hospital arrangements were in a more or less chaotic condition. Reorganisation in these cases was absolutely essential if the full facilities available in the public and voluntary hospitals were to be utilised. If the clause was to be permissive they would still be left in the same old position with regard to reactionary or lazy authorities. One of the hopeful features of the section dealing with the extension of hospital facilities was that it provided some remedy for the serious condition of the voluntary hospitals as regarded their accommodation. The Mackenzie Commission which reported in December, 1925, gave the total number of voluntary hospital beds in Scotland as 8589. There had probably been an increase since that time, but they estimated that 3600 additional beds were immediately needed in order to provide the necessary accommodation. The Edinburgh Royal Infirmary had a waiting list of over 2000 people, many of them being surgical and medical cases, including cancer cases. The same was true in regard to Glasgow and indeed the voluntary hospitals of Scotland did not provide except very partially for the needs of the community. In the poor-law hospitals and sick wards of poor houses there were 6100 beds. Of that number 4285 were grouped in the larger poor-law hospitals. One effect of this new clause would be that in those cases where the poor-law beds were not fully occupied they would be available to the local authority to meet the needs of the sick people in the district. It was surely even more necessary that immediate steps should be taken, seeing that there were these facilities, to prepare a scheme, not only for coördination, but for making the necessary additions and extensions in areas which quite evidently required it. In regard to the inquiry mentioned by the Solicitor-General

he wished to know whether it was to be a public inquiry with witnesses; whether it was likely to be expensive, with counsel representing the various conflicting authorities; and whether people with vested interests would be able to object to the necessary extensions and either defeat the object of the local authority or add considerably to its expenses in establishing approval of the proposed scheme.

After further debate,

The Lord Advocate's Reply.

The LORD ADVOCATE said that the Government felt that it would be a bit hard and unwise to make the preparation of schemes mandatory in the way which had been suggested. But he would point out that under Clause 50 every local authority was bound to exercise its functions up to a certain standard and to provide adequately for the health of the people in the district. The word "function" was defined as including not only duties, but powers, and as a lawyer he said that the power which was conferred on local authorities in this clause was one which they would be bound to exercise; otherwise their grant would be reduced.

The clause was read a second time and added to the Bill.

Recovery of Expenses for Treatment of the Sick.

The LORD ADVOCATE moved a new clause dealing with the recovery of expenses in connexion with the treatment of the sick. He said that at present the poor-law authority had power to recover expenses for the treatment of poor persons from those who were legally liable for the maintenance of those persons, and it was now proposed that all the hospitals under the new sick persons scheme should be put more or less on the same basis. The poor-law power, of course, would remain with the new body. There was an exception in the case of infectious disease and the reason for that was obvious. According to the customary practice infectious patients were compulsorily removed for the benefit of the community at large, and that made all the difference. The amount to be recovered was limited to a reasonable amount.

Dr. SHIELS said that he was glad that the Government had now amended this clause in accordance with suggestions made by the Opposition and to that extent he thought it was a great improvement on the original drafting. The use of the word "reasonable" was a great improvement. But he protested against the distinction still drawn between infectious and other diseases. He would like to say something about the maternity hospitals. A great deal was being done in regard to the reduction of maternal mortality, and one proposal which seemed likely to be fruitful was that instead of one big maternity hospital there should be a number of smaller hospitals in different parts of the town or the county where patients could be more readily and quickly attended and where a certain amount of isolation could be secured in cases where there was an infective condition. There was great scope for this development, because they knew that diseases associated with these conditions were responsible not only for many deaths, but for a great deal of chronic ill-health. They wanted to encourage the most ample provision for maternity hospitals. Yet in spite of the optional nature of this clause, and in spite of the insertion of the word "reasonable," it was still possible under it that a maternity hospital would have charges so high that women who required the treatment very badly would not be able to take advantage of its facilities. Therefore he urged the Lord Advocate very strongly to concede the exemption of maternity hospitals from the general operation of the clause.

After further debate,

The clause was read a second time and added to the Bill.

An amendment moved by Dr. SHIELS, to exempt maternity homes from the clause, was rejected by 203 votes to 88.

The Committee stage was completed, and the Bill as amended was reported to the House.

HOSPITALS AND RELIEF OF RATING.

On Wednesday, Feb. 20th, Colonel GRETTON presented the Hospitals (Relief from Rating) Bill, a measure designed to grant complete or partial relief from rates in the case of certain hereditaments used for the purpose of hospitals, infirmaries, dispensaries, convalescent homes, nursing homes, sanatoria, and other similar uses or in connexion therewith. The Bill was read a first time.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 20TH.

Rating of Voluntary Hospitals.

Mr. ROBERT MORRISON asked the Prime Minister, in view of the increased burden of rates thrown upon the voluntary hospitals by the Rating and Valuation Act, 1925, whether the Government would introduce a Bill during the present session to remedy this, upon an assurance by all parties in the House that such a measure would be regarded as non-controversial.—Sir KINGSLEY WOOD replied: The Rating and Valuation Act made no alteration in the basis of the valuation of hospitals. It is open to the assessment authorities now, as heretofore, to adopt a basis which will take full account of the special circumstances of voluntary hospitals dependent upon contributions from the public and of the responsibilities, conditions, and restrictions which affect their rateable value. Full rights of objection and appeal are available to any governing body which is not satisfied that due regard has been paid to these factors and is aggrieved by the assessment proposed. As I indicated recently, the complete or partial exemption of hospitals from rating by statutory enactment could not be considered apart from the claims of other charitable and public institutions, and the introduction of legislation to that end could not be undertaken in the life of the present Parliament. I understand, however, that the British Hospitals Association are proposing to submit to the Central Valuation Committee proposals for promoting greater uniformity in the assessment of voluntary hospitals and the adoption of a generally acceptable basis of valuation.

THURSDAY, FEB. 21ST.

Workmen's Compensation.

Mr. TINKER asked the Home Secretary if he was in a position to give the total amount of compensation paid under the Workmen's Compensation Act for 1927, and the number of fatal and non-fatal cases that it covered.—Sir W. JOYNSON-HICKS replied: The total compensation paid in the year 1927 (the latest year for which figures are published) in the seven great industrial groups for which returns are collected was £5,315,803; the number of fatal cases was 2567 and the number of non-fatal cases 455,852. I regret that no corresponding figures are available for the other industries under the Act, but an estimate of the total amount paid in these industries in respect of workmen's compensation for 1927 is given on page 8 of the statistics.

Committee on Mental Deficiency.

Mr. ROBERT MORRISON asked the President of the Board of Education whether he had now decided to publish the report of the Departmental Committee upon Mental Deficiency, and when it would be available.—Lord E. PERCY replied: I am arranging for the publication of the first section of the report, which will include all the Committee's findings and recommendations on matters falling within the scope of my department and the local education authorities, together with the report of a survey of the incidence of mental deficiency in certain typical areas which was carried out for the committee by one of the medical officers of the Board of Control. These documents are not yet in print, and in view of their length I am afraid that they will not be available before Easter. I should like to take this opportunity of thanking the Committee for a most valuable report which I believe will be of the greatest assistance to all those interested in the education of mentally deficient children.

Sick Leave among Welsh Women Civil Servants.

Mr. SNELL asked the Minister of Health what was the average number of days of sick leave per head taken in each of the last three years by women clerical officers, writing assistants, and members of the established typing grades, respectively; and what was the number of days of sick leave taken in the case of each of the grades concerned on account of gastric and nervous troubles, respectively, in the Welsh Board of Health and in the office of the Registrar-General for England.—Mr. CHAMBERLAIN replied: The following is the information asked for: The average numbers of days sick leave per head taken in each of the last three years by women clerical officers, writing assistants, and members of the established typing grades in the Welsh Board of Health (A) and in the office of the Registrar-General for England (B), respectively, were as follows:—

	(A)			(B)		
	1926.	1927.	1928.	1926.	1927.	1928.
Women clerical officers.	6·83	5·75	4·72	10·0	6·7	17·5
Writing assistants ..	5.43	8·82	10·47	11·8	18·8	16·7
Established typing staff	3·25	8·3	10·25	16·5	21·6	18·5

The information asked for in the last part of the question could not be obtained without the expenditure of an undue amount of time and labour.

Removal of a Typhoid Patient.

Mr. SHIELDS asked the Minister of Health whether he was aware that Mrs. George Cromarty, of Sydney Cottage, Holy Island, Northumberland, on Oct. 20th, 1928, suffering from typhoid fever, was ordered by the medical officer to rise from her bed and dress and then conveyed in an ordinary four-wheeled cab to the mainland three miles over the sands, the tide being up and the cab awash all the way, and the patient being in a sitting position during the journey; that the order for removal was given by the

medical officer without medical examination of the patient and against the advice of the local practitioner; that Mrs. Cromarty died within a few minutes of being transferred to the ambulance which was waiting; that, had the removal been delayed for a few hours, the ambulance car could have carried out the removal from the island, and that provision for isolation on the island could have been arranged; and would he cause a full inquiry into the circumstances of Mrs. Cromarty's death.—Mr. CHAMBERLAIN replied: This case has not previously been brought to my notice, but I am causing inquiries to be made of the local authority, and will communicate the result to the hon. Member.

Duty on Radium Compounds.

Mr. WEDGWOOD BENN asked the Secretary to the Treasury the total duty collected, since its imposition, on radium compounds, and whether he had any information as to the amount of radium and radium compounds at present in this country.—Mr. A. M. SAMUEL replied: From Oct. 1st, 1921, to Jan. 14th, 1927, duty was chargeable on the following radium compounds only—viz.: radium bromide and radium barium chloride. The duty recorded as collected on these substances from Jan. 1st, 1922, to Jan. 14th, 1927, was £6. The figures for Oct. 1st, 1921, to Dec. 31st, 1921, are not available. From Jan. 15th, 1927, duty became chargeable on all radium compounds, and the amount of duty recorded as collected for the period Jan. 15th, 1927, to May 14th, 1928, when the duty was suspended, was £80. As regards the second part of the question, I would refer the hon. member to the reply given on Jan. 24th by the Minister of Health. I have no further information on the point.

MONDAY, FEB. 25TH.

Colonial Surgical Appointments.

Dr. SHIELS asked the Secretary of State for the Colonies if he was aware that in one colony certain surgical appointments were reserved for holders of the fellowship of a particular Royal College of Surgeons; whether this practice had the approval of the Colonial Office; and, if not, whether he would call the attention of the Colonial Government in question to the matter.—Mr. AMERY replied: I have been informed that in one of the colonies there is a departmental regulation that has the effect of excluding from consideration for certain surgical appointments candidates other than holders of a particular surgical diploma. I do not think that assignment to particular technical posts can fairly be based on academic qualifications alone, to the exclusion of other qualifications such as experience, skill, and personal suitability. I am inviting the attention of the Colonial Government concerned to the question.

Poisons and Pharmacy Acts Committee.

Sir WILFRID SUGDEN asked the Minister of Health when the Report of the Inter-Departmental Committee on the Poisons and Pharmacy Acts would be available, as its findings were essential to certain improvements in the interests of public convenience and health matters generally.—Lieut.-Colonel Sir V. HENDERSON (Under-Secretary to the Home Office) replied: I understand that the chairman of the Committee expects that the Committee's report will be submitted to the Lord President of the Council in the spring or early summer.

Rickets in Distressed Mining Areas.

Dr. VERNON DAVIES asked the Minister of Health what steps he was taking to deal with cases of early rickets in the distressed mining areas of South Wales and Monmouthshire, and if he was satisfied that these measures were adequate for all possible needs in the near future.—Sir KINGSLEY WOOD replied: The measures taken to prevent the onset of rickets and to deal with such cases as arise are a matter in the first instance for the maternity and child welfare authorities of these areas. My right hon. friend is advised that the authorities are alive to the importance of this matter, and he has recently sanctioned increased expenditure on the supply of milk to expectant and nursing mothers and young children in these areas.

Mr. PETHICK-LAWRENCE asked whether the cost of this milk was deducted by the guardians from the amount of relief given to the families

Sir KINGSLEY WOOD: No; there has been no deduction in these areas.

Dr. VERNON DAVIES asked whether the right hon. gentleman would communicate with the health authorities in order to see that cases of rickets were followed up after treatment.

Sir KINGSLEY WOOD said that he would look into that.

Mr. T. WILLIAMS asked if the right hon. gentleman was not aware that in the report submitted to the South Wales Mining Association it was definitely stated that the appointed commissioners were responsible for the reduction in the amount of grants for poor-law relief, and that that had contributed to a large number of cases of rickets.

Sir KINGSLEY WOOD said he was not aware of that report.

Mr. PETHICK-LAWRENCE: Is the right hon. gentleman not aware that I myself in this area was informed by the guardians that they had cut down the amount of relief to families where milk was given to the children.

Sir KINGSLEY WOOD: I cannot understand that, because there was no reduction made in the estimates in regard to milk in the distressed areas.

Miss WILKINSON asked whether the question was not whether the Department made a reduction, but whether it was a fact that the commissioners in the area and the poor-law authorities had deducted from the relief given to the families the cost of the milk given to the mothers.

Sir KINGSLEY WOOD: No; I am not aware of that, and there have certainly not been any instructions given by my Department to that effect.

Mr. SOMERVILLE asked whether far more relief was not being given now than in 1924.

Dr. VERNON DAVIES: Is the right hon. gentleman aware that this is not simply a question of shortage of food, but of improper food that the children are having?

Sir KINGSLEY WOOD: Yes, and I would remind the House that in the report just issued it was stated that to a great extent disease has been controlled by means of maternity and child welfare services.

Hygiene on Mercantile Vessels.

Dr. VERNON DAVIES asked the President of the Board of Trade if he was aware that during the years 1917 and 1918 certain amenities with regard to the hygiene of crews' spaces were enforced in standard ships; and whether these same amenities were still enforced by the Board of Trade.—Mr. H. G. WILLIAMS (Parliamentary Secretary to the Board of Trade) replied: The crew space arrangements on standard ships during the war were to some extent in excess of the regulation requirements of that time, and the present improved requirements are frequently exceeded on ships built now.

Dental Benefit in Scotland.

Mr. JOHNSTON asked the Secretary for Scotland whether he could say if insured persons in Scotland had a choice of dentist when receiving dental benefit; and, if so, under which clause or regulation.—The LORD ADVOCATE (Mr. W. WATSON) replied: Under para. 4 of Schedule C of the Scheme of Additional Benefits of an approved society providing dental benefit, an insured member is entitled to obtain dental treatment from any registered dentist who is willing to provide the treatment in accordance with the terms of the schedule and on the scale of fees, if any, for the time being recognised by the Committee of Management of the society. Where, however, the work or conduct of a dentist has been declared to be unsatisfactory a society may notify their members that that dentist is excluded from giving treatment under the schedule.

TUESDAY, FEB. 26TH.

Medical Practitioners and Mobilisation.

Mr. MALONE asked the Secretary of State for War whether he was aware that circular letters were being addressed by the district military headquarters to medical practitioners in the district requesting the practitioners to fill in a form stating whether, in the event of mobilisation, they would be willing to devote a portion of their time to work in the local military hospitals in order to fill the vacancies created by the withdrawal of regular Royal Army Medical Corps officers for the expeditionary force; whether this registration of doctors for military purposes was being carried out all over the country on his instructions; and, if so, with what object.—Sir L. WORTHINGTON-EVANS replied: Inquiries are being made by the military authorities in various parts of the country to see how far the local civil medical practitioners can be counted on in the event of mobilisation to act in a civil capacity in hospitals in the United Kingdom in place of Royal Army Medical Corps officers until relieved by other Royal Army Medical Corps officers.

Pensioners and Treatment Allowances.

Mr. BELLAMY asked the Minister of Pensions, seeing that great hardship was inflicted on the families of men undergoing treatment in cases where allowances were not payable several persons, women and children, having to live on a flat-rate pension of 8*s.* a week in some instances, and that a pensioner undergoing institutional treatment could not accept or follow a remunerative employment, if he would authorise the payment of full treatment allowances in all cases of institutional treatment whether the pensioner was in employment or not when admitted.—Lieut.-Colonel STANLEY replied: Special allowances during treatment are, as my right hon. friend has more than once explained, payable only where the man has incurred loss by having to give up a remunerative occupation in consequence of the treatment; and allowances are nevertheless paid (both

the case of in-patient and other forms of treatment) where the man is proved to be ordinarily an earner, notwithstanding that he may have been temporarily out of employment at the time of commencing treatment. There would be no justification for the payment of these special allowances in cases where there is no evidence to indicate that, apart from the course of treatment, the men would be engaged in remunerative occupation, and their ability to provide for themselves and their families is therefore not adversely affected by their treatment.

Medical News.

UNIVERSITY OF OXFORD.—In Convocation on Feb. 26th a decree was passed to discontinue the examinations for the Diploma of Public Health until further notice.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful in the undermentioned subjects:—

Surgery.—T. A. Barnabas, Bristol; C. M. Brooks, Durham; N. Das, London Hosp.; H. W. E. Dickey, Manchester; R. Frankling, Guy's Hosp., K. E. Gallaher, Manchester; and K. Girgis (Section I.), Manchester and Charing Cross Hosp.

Medicine.—W. A. A. Collington, Guy's Hosp.; H. M. Feldman, Leeds; L. P. Gregory, Bristol; C. K. McCoan, St. Mary's Hosp.; and C. F. C. White, Guy's Hosp.

Forensic Medicine.—C. W. Ellison, St. Bart's. Hosp.

Midwifery.—R. K. Nandlal, Birmingham, and C. Skinner, Guy's Hosp.

The Diploma of the Society was granted to the following, entitling them to practise medicine, surgery, and midwifery:—T. A. Barnabas, C. M. Brooks, W. A. A. Collington, N. Das, L. P. Gregory, C. K. McCoan, and C. F. C. White.

UNIVERSITY OF LONDON.—At a meeting of the Senate on Feb. 20th an offer by the trustees of the late Mr. C. H. Clark of a sum of £10,000 for the establishment of a Lectureship in the History and Progress of Preventive Medicine and Tropical Hygiene was accepted with thanks.

The Senate also accepted with thanks a grant of £1000 from the Beaverbrook Fund for Medical Research, which had been forwarded by the Prime Minister. The grant will be applied to the purposes of, and administered under, the scheme for the Thomas Smythe Hughes Medical Research Fund.

Prof. W. E. Le Gros Clark, F.R.C.S., was appointed as from Sept. 1st, 1929, to the University Chair of Anatomy tenable at St. Thomas's Hospital Medical School. In 1924 Prof. Le Gros Clark was appointed to the University Readership in Anatomy tenable at St. Bartholomew's Hospital Medical College and in 1927 to the University Chair of Anatomy there.

Mr. T. G. Hill, D.Sc., was appointed to the University Chair of Plant Physiology and Mr. E. J. Salisbury, D.Sc., to the Quain Chair of Botany, both tenable at University College.

A degree of Ph.D. was instituted in non-clinical subjects for both internal and external students in the Faculty of Medicine.

The Geoffrey E. Duveen Travelling Studentship in Oto-Rhino-Laryngology, of the value of £450, was awarded for 1929 to Mr. Nehemiah Asherson, M.B.

On the recommendation of the School Committee of University College Hospital Medical School, Mr. G. R. Cameron, M.B., has been appointed to the Graham Scholarship in Pathology for two years from Sept. 1st, 1928.

A course of three lectures on Some Biological and Epidemiological Aspects of Helminthic Infection will be given by Prof. F. Fülleborn (of the Institut für Schiffs- und Tropenkrankheiten, Hamburg), at the London School of Hygiene and Tropical Medicine (25, Gordon-street, W.C. 1) on Monday, Tuesday, and Wednesday, March 11th, 12th, and 13th, at 5.30 P.M. At the first lecture the chair will be taken by Dr. G. Carmichael Low.

COLLEGE OF PESTOLOGY.—A luncheon was held at the Hotel Cecil on Feb. 20th, at which the chairman of the College of Pestology, Mr. A. Moore Hogarth, was presented with his portrait in oils. The President, Sir William Bull, who was in the chair, read a letter of felicitation from Sir Thomas Horder, the Deputy President, who was prevented from attending. The presentation was made by Prof F. T. G. Hobday, and Mr. Hogarth, in reply, recounted the experience which had led him to found the College and suggested that the time had come for a change of name, possibly to the "College of Microbiology."

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE. A course in general medicine and surgery, including the special departments, with special reference to recent advances in these subjects, will be held at the West London Hospital, Hammersmith, from March 11th to 23rd.

WEST END HOSPITAL FOR NERVOUS DISEASES.—A Savill Prize, value £15, is offered for a thesis on a neurological subject approved by the examiners before April 9th. Candidates must have attended the practice of the hospital at least ten times and theses must be received not later than Oct. 31st. Further information may be had from the Secretary of the Hospital, Welbeck-street, London, W. 1.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—The annual general meeting of this Association will be held at the Rooms of the Society of Medical Officers of Health, 1, Upper Montague-street, Russell-square, London, W.C., on Friday, March 15th, at 5 P.M. (tea 4.30 P.M.), when Sir Henry Gauvain will read a paper on Combined Education and Treatment of Children Suffering from Physical Defects.

COURSES FOR DIPLOMA IN PSYCHOLOGICAL MEDICINE. Lectures and practical courses at the Maudsley Hospital, Denmark Hill, S.E. have been arranged by the London County Council, beginning on March 6th. Particulars may be had from the Director of the Central Pathological Laboratory at the hospital. There is also opportunity for clinical experience and instruction, concerning which application should be made to the Medical Superintendent.

POST-GRADUATE FACILITIES IN MANCHESTER.—The post-graduate lectures and demonstrations at Manchester Royal Infirmary have been resumed and will be held each Tuesday (except April 2nd) till May 14th. On Fridays, from March 1st, demonstrations of clinical cases and methods will be given in the wards and special departments. These will be continued (except on March 29th and April 5th) till May 10th. All the lectures and demonstrations will commence at 4.15 P.M. (tea at 3.45 P.M.). Post-graduate lectures at Ancoats Hospital are also being continued this session on certain Thursdays at 4.15 P.M. (tea at 3.45 P.M.). Notices of lectures at both hospitals will be found weekly in our Medical Diary.—A post-graduate intensive course in obstetrics and gynæcology will be given at St. Mary's Hospital, Whitworth-street, Manchester, from Saturday, June 15th, to June 22nd, inclusive. Further particulars of this and other courses can be obtained from the Dean of the Medical School at the University.

HOSPITAL ACCOMMODATION IN THE IRISH FREE STATE.—In a brief debate on this subject in the Senate last week, the MacGillicuddy of the Reeks moved that the Minister for Local Government and Public Health should exercise his powers to ensure that adequate hospital accommodation should be provided in the County Kerry at an early date. He said that the present accommodation was inadequate, and patients under treatment had to be removed prematurely to make place for others. Sir Edward Bigger urged that a wider issue should be considered. He thought that a committee should be appointed to investigate the whole question of the provision of treatment for major operations. In his reply, the Minister did not touch on the larger question, but stated that the case of Kerry was receiving full consideration.

BILLROTH CENTENARY CELEBRATIONS IN VIENNA.—Medical men and scientists from all over the world will honour the memory of the great Austrian surgeon, Theodore Billroth, in April next, in which month the hundredth anniversary of his birthday occurs. The Medical Faculty of the University of Vienna, the Vienna Academy of Science, and the Medical Society of Vienna have united to organise special centenary celebrations on April 9th and 10th in the city where Billroth practised and taught, and it is expected that the medical professions and scientific associations of many foreign countries will be represented. The idea of holding centenary celebrations originated in the small circle of those in Vienna who can claim to have had the privilege of learning at the feet of the great teacher of surgery, but Billroth's disciples and admirers are to be found in the chairs of medicine and surgery of every country in the world and not only in Austria and Germany. Full particulars of the centenary celebrations can be obtained from the Akademie der Wissenschaften in Wien (Universitätsplatz 2, Vienna I.).

MUNICIPAL SUN LOUNGE.—What is described as the first municipal sun lounge to be built in Great Britain was opened at Torquay on Feb. 20th by Dr. Leonard Hill, F.R.S. Ninety-five feet long, it faces due south and has walls and a roof of vitaglass.

STIRLING ROYAL INFIRMARY.—By the opening of the new maternity block, the extensions to this hospital, which have cost £108,000, have been completed. There are now 20 beds in this part of the institution, provided one-half by the Stirling Town Council and one-half by the Central District Committee of Stirling County Council.

WORK OF ST. GEORGE'S HOSPITAL.—Speaking at the annual general meeting of the Ladies Association at St. George's Hospital last week, Sir Crisp English, the senior surgeon, said that the hospital averaged about 500 night emergency operations a year. There are 4000 operations annually and four new operating tables are badly needed. There had been 180,000 out-patients and 24,000 in-patients in the electrical massage department. Without having any definite research endowment, the hospital was doing cancer research in a quiet way in the course of clinical work, and influenza research was being pursued.

SCOTTISH HOSPITALS.—The report by the managers of the Glasgow Royal Infirmary shows a shortage of £10,127 on the year's working, and for the first time for many years it has been necessary to borrow money from the bank. There were 16,488 in-patients under treatment during the year, the average number resident daily being 783·8 and the average period of residence 17·4 days. A total of 97,258 outdoor patients were treated in dispensaries and other departments. The total ordinary revenue for the year was £87,815, and the total ordinary expenditure £122,178. 130 beds and 11 cots are now endowed and the restricted capital funds amount to £295,830. Through the generosity of Mr. William C. Teacher, of Cive, Dumbartonshire, who gave £10,000 for the purpose, a University lectureship in bacteriology at the Royal Infirmary has been founded.—Aberdeen Royal Infirmary's annual report refers to the numerous cases resulting from motor accidents, which have created a two-fold problem by the expense they involve and by the prolonged occupation of beds that are required for other purposes. The decision of the Students' Representative Council to suspend their gala week in 1929, the report continues, is regretted. While fully recognising the stupendous amount of time and labour which the gala involves, the directors say that they cannot but view with concern an interruption in what has come to be regarded as a regular and considerable source of revenue for the infirmary. They therefore venture to hope that some time this year the students may find it possible to do something which will provide a contribution to the infirmary funds, and maintain continuity of the methods of organisation and administration which have hitherto proved so successful. The total number of patients admitted to the infirmary last year was 31,115, an increase of 2647 over those admitted in 1927.

DRUGS FOR INSURED PERSONS: APPOINTMENT OF AN ADVISORY COMMITTEE.

IN order to assist insurance committees to proceed on uniform principles in dealing with questions of difficulty as to the definition of drugs and medicines for the purposes of medical benefit under the National Health Insurance Acts, the Minister of Health has now appointed an advisory committee. This committee is to consider and report to the Minister upon questions which he refers to them. Certain questions which are known to have occasioned difficulties of definition in the past have already been referred to it; any further proposal should be submitted in the first instance to the Medical Department of the Ministry accompanied by full particulars of the circumstances in which a difficulty of definition has arisen. The membership of the committee is as follows: Dr. Dudley G. Greenfield (chairman), Mr. T. Allsop, J.P., Dr. J. J. Day, Sir Walter Fletcher, F.R.S., Mr. J. E. French, M.P.S., Dr. A. F. Heald, Mr. W. Gill Hodgson, Mr. E. Lewis Lilley, F.R.C.S., Mr. F. Llewellyn-Jones, LL.B., Mr. G. A. Mallinson, Mr. Edwin Potts, B.Litt., Mr. Philip F. Rowsell, F.C.S., Mr. Thomas Tickle, F.I.C., with Miss E. M. R. Russell (secretary). All communications should be addressed to the secretary of the Advisory Committee on the Definition of Drugs, Ministry of Health, Whitehall, London, S.W. 1.

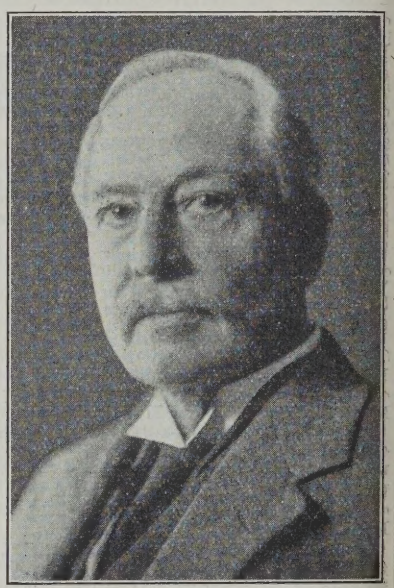
Obituary.

GEORGE NEWTON PITT, O.B.E., M.D. CAMB., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO GUY'S HOSPITAL.

WE much regret to announce the death of Dr. Newton Pitt, which occurred at his house, Southdene, Walton-on-Thames, on Friday, Feb. 22nd, in the seventy-fifth year of his age.

George Newton Pitt was born in London in 1853, the eldest son of the late Mr. George Pitt, of Sutton, Surrey. He was educated at Christ's College, Finchley, whence he proceeded with a scholarship to Clare College, Cambridge, and after a distinguished career as a student graduated in 1876 as tenth wrangler, being duly elected Fellow of his college later. Deciding to enter the medical profession, he joined the medical school at Guy's Hospital in 1878, took the M.R.C.S. Eng. in 1881, graduated in medicine at Cambridge, where he proceeded to the M.D. in 1884, the same year in which he took the M.R.C.P. Lond. After post-graduate work in Vienna he was elected assistant physician at the East London Hospital for Children, and in 1887 assistant physician to Guy's Hospital, after a short period as medical registrar. As assistant physician, and ten years later as full physician, Pitt remained on the staff of the hospital his full term, being elected consultant physician just before the war. His long and intimate association with the hospital is well brought out in the following note from his friend and colleague, Sir William Hale-White:—



DR. NEWTON PITT.
Photograph: Elliott & Fry.

"George Newton Pitt came to Guy's in 1878 with a considerable mathematical reputation from Cambridge. He had already done his anatomy and physiology and so he passed at once into the wards and held all the usual appointments, including that of house physician. The members of the staff for whom he worked most and who chiefly attracted him were Howse and Moxon, both then at the height of their notability as great teachers. Pitt became medical registrar and in 1887 was appointed assistant physician at the same time as Sir Cooper Perry and Leonard Charles Wooldridge. He remained on the active staff until he retired under the age limit of 60 shortly before the war. He had not been long among his fellow medical students before they discovered that there had come among them a very lovable man; he made many friends, perhaps the closest was that remarkably brilliant man Ryle, the brother of the late Bishop Ryle, Dean of Westminster, and the father of Dr. Ryle, now on the staff at Guy's. He and Pitt lived together for a time, and it was a real pleasure to spend an evening with them

You could not help being fond of Pitt, his kindness, his equanimity, and serenity compelled your affection. If you were ill he came to see you and you felt encouraged by his visit. His feeling for the unfortunate and his desire to help them actively was shown by the assiduity and industry with which, for many years, he gave endless time and patience while carrying out his duties as hon. secretary to the Royal Medical Benevolent Fund. Waves of troubles, whether his own or those of others, passed over him, leaving him uninjured and just as fresh as ever to throw his best energy into repairing the mischief. A few years ago he suffered severely and for a long while from sciatica, but to his visitors he was always cheerful, and likewise in his fatal illness it was the same; he was pleased to see a friend and optimistic about himself. He was one of the few who was never known to have an enemy, and the more you saw of him the more you admired in him the nature that never sought its own advantage, was always generous in its appreciation, indefatigable in its service for others. The same characteristics came out in Pitt the physician; he took infinite labour to discover what was the matter with his patients, in his desire to relieve them no trouble was too great, in the same way he was unwearying in the pains he took to teach the students attached to him."

Newton Pitt's connexion with the Royal College of Physicians of London was an important one. Elected F.R.C.P. in 1889, he was Goulstonian lecturer in 1890, Bradshaw lecturer in 1910, and senior censor in 1918. He acted also as examiner in medicine at the Conjoint Board, as well as for the Universities of Cambridge and London at various times. The subject of the Goulstonian lectures was Cerebral Lesions, and in the series of three discourses the lecturer summarised very clearly contemporary knowledge upon the fatalities of ear disease, the manifestation of meningitis, cerebral abscess, and sinus thrombosis having origin other than in disease of the ear, and the signs and symptoms of cerebral embolism and aneurysm, as recorded in the Guy's Hospital Reports. In the Bradshaw lecture, delivered 20 years later, he discussed fully the results of bronchial obstruction, and again showed his high ideal of the responsibilities of the hospital physician by basing his observations and teaching upon the Guy's Reports. He was an infrequent writer, but in a contribution to Allbutt and Rolleston's System, upon right-sided valvular lesions of the heart, the same anxiety to base his observations upon the records of Guy's Hospital and other institutions, where the evidence could be confirmed or challenged, is apparent.

Another side of his work was his charitable energy exerted on behalf of the less fortunate members of the medical profession. For many years he was secretary of the Royal Medical Benevolent Fund, and of his labours in this cause the treasurer of the Fund, Sir Charters Symonds, writes as follows:—

"The Royal Medical Benevolent Fund has lost by the death of Dr. Newton Pitt not only a warm supporter but an untiring Hon. Secretary. During the 15 years he acted in this capacity his interest never flagged, and his wide knowledge of the various charitable agencies which might contribute to the necessities of those with whom he was immediately concerned proved of great value. The work of investigating the applications for relief fell upon him and involved not unfrequently personal inquiries as well as correspondence in order to confirm various statements or obtain additional information. His wise discrimination in these inquiries, and the manner in which the cases were presented, enabled the committee to adopt his decisions with confidence. It will be readily understood that the investigation of about a dozen new applications each month, and the review of some 20 to 30 old cases, involved considerable labour. Dr. Pitt, however, never failed, nor was he ever more informing and accurate than at the last meeting he attended a week before his death. Not only did he know the history of the many beneficiaries receiving grants, but also that of the numerous annuitants. In financial matters his mathematical acquirements (he was a Cambridge Wrangler) and logical outlook proved of essential service. In the larger questions of policy his clear vision and long views guided the Fund through many difficulties. The growth in the activities of the Fund during his secretaryship will be appreciated when it is mentioned that when he took over the duties there was one part-time secretary, while at present there are three clerks constantly at work under a salaried secretary, and the number of grants made and of annuitants benefited has risen proportionally.

When the War Emergency Fund was started by the late Dr. Samuel West in 1916, the duties of secretary devolved upon Dr. Pitt, and into this branch of the work he threw his energy and interest, interviewing with other members of the special committee many of the applicants, promoting the education of some 150 boys and girls, and enabling many practitioners to resume their practices or to find new positions. One of his last acts was to wind up this Fund, having taken a leading part in the administration of the £30,000, two-thirds of which had been raised by the profession, the remainder being a contribution from the National Service Fund. It will not be easy to find another possessing such abilities and such devotion. His unfailing courtesy, his unruffled temper, his fine sense of comradeship, his appreciation of the views of others, will long be remembered by those associated with him in his charitable work."

EDWARD LEICESTER ATKINSON, D.S.O., M.R.C.S. Eng.

Surgeon-Captain E. L. Atkinson, R.N., who died on Feb. 20th and was buried at sea, was a man whose life brought credit to his profession.

The son of Mr. and Mrs. E. L. Atkinson, of Trinidad, he was born in 1882 and was educated at Forest School. From there he entered St. Thomas's Hospital, where he held house appointments after qualifying in 1906. As a student he already showed the toughness of character and physique that distinguished his later career, and he gained the United Hospitals light-weight boxing championship in 1905. On entering the Royal Navy he passed out top of his batch at Haslar and was awarded a medal.

In 1910 Atkinson joined Captain Scott's Antarctic expedition. During the long and arduous voyage south in the *Terra Nova* he became the close friend of Captain L. E. G. Oates, a circumstance that may be recorded as a hall-mark of high honour. Throughout the expedition he distinguished himself as a man who sought arduous duties for the satisfaction they brought him. In the second autumn, when the *Terra Nova* returned to the base at Mount Erebus, expecting to bring home the whole expedition, two sledging parties were missing. The first was the Geographical Pole Party under Captain Scott, the other the Northern Party, who were away sledging in the direction of the magnetic pole. To avoid the possibility of entanglement in the winter ice, it was needful for the ship to return to New Zealand, and Atkinson was left at the base in charge of a party to spend the winter there and render assistance to any that might have survived. Those who had gone off in the hope of finding Scott and his companions returned without news of them. Meanwhile Atkinson made a strenuous attempt to succour the Northern Party but was baffled by the ice conditions. After spending the winter at the base, and in the belief that neither of the missing parties would have survived the winter, Atkinson led his party off to search for the bodies and records of Captain Scott and his companions. He found the bodies of Captain Scott, Dr. Wilson, and Lieutenant Bowers a hundred miles away to the south. Eighteen miles further Captain Oates had made his historic sacrifice in walking out to his death in a blizzard to save his companions. Failing to find his body, Atkinson

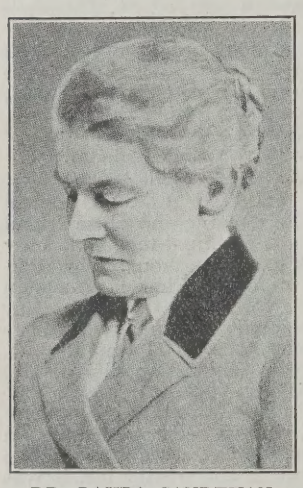
erected a cairn to his memory, marked with the now classical epitaph: "Hereabouts died a very gallant gentleman."

Atkinson's career during the war was exactly in accordance with his character. After service with the Grand Fleet he went with the Royal Naval Division to Gallipoli, and later served with a howitzer brigade in France, where he was badly spattered in the face by a bursting shell, partly losing the sight of one eye. After this he served in H.M.S. *Glatton* at Jutland. When the ship was torpedoed and sinking a fire broke out. Atkinson went below and brought up a man. He was almost blinded, but made his way down again, bringing another man up. He then became unconscious. This act of his was not known until his commanding officer, who was himself wounded, long afterwards collected the evidence and recommended him to the notice of the Admiralty. He was awarded the Albert Medal and the D.S.O.

In March, 1920, Atkinson won the Chadwick gold medal and prize given once in every five years for special work in promoting the health of the Navy and Army. He had done good scientific work in helminthology and bacteriology, having a clear and exceptional scientific mind, which might have gained him distinction in research if his health had not been severely damaged by the hardships and wounds he had suffered. His death at sea was a fitting circumstance and one that he himself would have desired.

LAURA STEWART SANDEMAN, M.D. EDIN., J.P.

THE death of Dr. Laura Sandeman last week, as the result of influenzal pneumonia, has cast a gloom over the city of Aberdeen in which she was described without exaggeration as the best-loved woman. The eldest daughter of a large Perthshire family, she was already familiar with public work before taking a medical course at Edinburgh University. Qualifying in 1903, she settled in Aberdeen and soon became family physician to the east end of the city, whilst losing no opportunity of social or public health service. Having started in her teens to inaugurate a sewing class and savings bank in her native village, she was the first to see the need for a centre in the poor and crowded district of Torry, at which mothers could attend and bring their babies for advice and treatment, and as time went on her advocacy of child welfare possessed her more and more, and she was widely in request as a lecturer on this and kindred subjects. At the outbreak of the late war Dr. Sandeman brought herself only after a struggle to depute her work in Aberdeen to others and to join the staff of the Scottish Women's Hospital in France, which she left to become controller of medical services to Queen Mary's Army Auxiliary Corps, her organising ability when given free scope proving to be of a high order. The same ideal of citizenship entered into her political work, for on her last appearance on the political platform she urged her fellow-women to make use of their suffrage, to whichever party they adhered. Twice she stood without success for North Aberdeen, on the former occasion returning from a continental holiday to canvass the constituency. Her death has called out on all sides testimonies to her ability and singlemindedness which may be summed up in the words of a colleague: "She had qualifications for public service of the highest order; she was in addition a woman who inspired affection and who made richer the lives of all who knew her." Dr. Laura Sandeman's death at 67 years of age makes the first gap in a family circle which includes Mr. James Sandeman, K.C., Sheriff of Perth, and Mr. A. N. S. Sandeman, M.P. for Middleton and Prestwich.



DR. LAURA SANDEMAN.
Aberdeen Press and Journal.

DENIS WALSHE, M.D. N.U.I., J.P.

Dr. Denis Walshe, whose death occurred last week at Craiguenamanagh, Co. Kilkenny, in his eighty-fourth year, was one of the most highly respected general practitioners in Ireland. A student of the old Catholic University in Dublin, he took the licence of the Royal College of Surgeons of Edinburgh in 1869, and of the King and Queen's College of Physicians of Ireland in 1871. In 1915 the honorary degree of M.D. was conferred on him by the National University of Ireland. In his younger days he practised for several years in England, but over 40 years ago he returned to his native country and was appointed medical officer of the Graigue dispensary district. He also held for many years the office of coroner for the county of Kilkenny. Engaged in a busy country practice, Dr. Walshe kept his mind open to the advances of medical knowledge, and he was regarded both by his colleagues and the public as a sound and wise practitioner. It is more than 50 years since he first contributed to our own columns a note on ligature of the femoral artery in two cases under his care, the material being the newly introduced carbolised catgut. He interested himself in public affairs, and had been chairman of the County Kilkenny Insurance Committee since its foundation in 1912. He was active in the various medical organisations, in which his wise judgment carried great weight. For many years he represented the South-Eastern of Ireland Branch on the Council of the British Medical Association. His geniality, his hospitality, and his sturdy upright character gained him respect and affection everywhere. To his colleagues he was a loyal and helpful friend, to his patients a trusted and wise adviser.

JOHN LOGAN STEWART, M.B. GLASG., D.P.H.

Dr. Logan Stewart, who died of pneumonia in Manchester on Feb. 20th, in his fiftieth year, was consultant tuberculosis officer to the Lancashire County Council. He graduated at Glasgow M.A. in 1900 and M.B., Ch.B. in 1905, adding the D.P.H. Camb. three years later. He then entered the service of the council as medical inspector of schools, and in July, 1913, he was appointed to supervise the tuberculosis service in the south-eastern section of the county (with a present population of 370,000), with a chief dispensary at Ashton-under-Lyne and five branch dispensaries in neighbouring towns. Dr. Stewart was the first member of the county tuberculosis staff to undertake his own X ray work, and this he developed to a high degree of efficiency. Several of his contributions may be read in the annual reports on tuberculosis work in Lancashire, and his views on the value of X ray work in a tuberculosis dispensary were set out in an article which appeared in *Tubercle* in 1927. He also did pioneer work in the treatment of tuberculosis by artificial light, demonstrating its use particularly in the treatment of lupus and adenitis with abscess formation and skin involvement. Latterly he had devoted much time to the relation of tuberculosis and silicosis, his preliminary report being published in the current issue of the *British Journal of Tuberculosis*.

Dr. G. Lissant Cox writes: "In the last 10 or 15 years the tuberculosis service in the North of England has had two exceptionally gifted clinical tuberculosis officers—the late Dr. W. C. Rivers, district tuberculosis officer of the West Riding County Council, and John Logan Stewart. Stewart was a

typical Lowland Scot. Austere yet kind, bent but not broken by the death of his wife some three years ago, engrossed in his work, possessed with a sure judgment and an entirely unselfish nature; these qualities made him loved and respected by all his colleagues, patients, and the doctors who so frequently consulted him. Visitors from many lands went to Ashton-under-Lyne; all returned impressed with Stewart's work. But this it was which made him stand out above the crowd: Woven into every part of his being and controlling his unceasing work was a fierce yet sane sympathy with the sufferer from tuberculosis. For such sufferers he lived, and for them he died."

Dr. J. R. Kerr writes: "The passing of John Logan Stewart will be regretted with particular poignancy by his old classmates of Glasgow University. One remembers the steadfast honesty of his mind and the most lovable gentleness of his manner. Whatever Stewart set his hand to he did with all his might. Many will miss his counsel as a tuberculosis specialist, as an expert in the radiology of the chest, or in the theory and practice of ultra-violet ray treatment. But all who knew him will cherish the memory of his sterling character and of his full-hearted devotion to the cause of the suffering."

WALTER AUBREY KIDD, M.D. LOND., F.R.S. EDIN.

WE regret to announce the death of Dr. Walter Aubrey Kidd, who died on Thursday, Feb. 21st, at Cape Town, in the seventy-sixth year of his age. A son of the late Dr. Joseph Kidd, the well-known physician of Blackheath, and the brother of Dr. Percy Kidd and Mr. Frank Kidd, he was educated at Uppingham, whence he proceeded to the medical school at Guy's Hospital. Here he had a very successful career, graduating at the University of London as M.B., B.S. in 1876 with honours and the gold medal for forensic medicine. He proceeded to the M.D. in the following year, having immediately after his residence at Guy's Hospital begun to practise medicine at Blackheath. Here by individual merit as well as family connexions, he enjoyed a very large practice, from which he had recently retired.

Walter Kidd was an original and observant student of the problems of heredity, and his communications to our pages on this and allied subjects were always of interest, while he was the author of several thoughtful monographs having similar scope, for example, an essay on Use-Inheritance, and two such books, entitled the "Direction of Hair in Animals and Man," and the "Sense of Touch in Mammals and Birds."

GEORGE VERE BENSON, M.A. CAMB., M.R.C.S. ENG.

AFTER a long period of ill-health Dr. G. V. Benson died at Lewes on Feb. 21st at the age of 81. He was a familiar figure in East Sussex, inasmuch as for 28 years he was coroner for what is known as the Lewes district, which comprises the greater part of the administrative county of East Sussex, and also Eastbourne. He was appointed to this office in 1899 by the casting vote of the then chairman of the county council, who wanted to see a medical man holding the coronership instead of the customary solicitor. Dr. Benson had at that time had several years' experience of the work, having been for five years deputy coroner for the western division of Middlesex. In East Sussex he is said to have conducted at least 6000 inquests, and when Eastbourne became a county borough entitling it to elect its own coroner, the corporation decided to continue his appointment as showing appreciation of his services. He retired in 1927.

Dr. Benson was born in Dublin, his father being Mr. Charles Benson of that city. He was educated at Trinity College, Dublin, and Downing College, Cambridge. At Cambridge he was placed as a wrangler in the mathematical tripos, after which, embarking on the study of law, he was called to the Bar in 1878. Some years later he decided to study medicine, and qualified in 1893. From 1908 to 1910 he was vice-president of the Coroners' Society of England and Wales. A somewhat prolific writer, he contributed, inter alia, to the "Encyclopædia of the Laws of England," and "The Dictionary of National Biography."

Dr. Benson married a daughter of David Bateman Thornton, by whom he had one son.

MISS HELEN HUNTER BAILLIE, who died in London on Feb. 11th in her eighty-sixth year, was the last of the third generation in descent from Dorothea, the sister of John Hunter, "the founder of scientific surgery" and the creator of the museum of the Royal College of Surgeons of England. Of the nine brothers and sisters of John Hunter, only Dorothea married, and the children of John Hunter all died without issue. The fourth generation from the Hunters is now represented by the children of her sisters, Mrs. Oliver and Mrs. Maconechy. Of the former there are four living—the Rev. Robert Baillie, Helen, Dorothy, and Angela Oliver. The eldest, Rachel, died a martyr to devotion to hospital work. The second son, Matthew M. B. Oliver, F.R.C.S., well known as an ophthalmic surgeon, died in 1926. Of the three daughters, Muriel, Sophia, and Joanna, of Mrs. Maconechy, the eldest, Muriel, married Thomas B. Jobson, M.D., of Netherwood, Guildford. Thus the fourth generation is represented by but seven. The fifth generation is reduced to four, the one son, Patrick Hunter Jobson, and three daughters of Mrs. Muriel Jobson.

Miss Hunter Baillie's devotion to medicine and especially to "the College" was great. With loving care she guarded the pictures, relics, and letters of the Hunters, William and John, and finally placed them in their present resting place under the care of Sir Arthur Keith at the Royal College of Surgeons. Until a year or two ago she attended the Hunterian Orations and much enjoyed the courtesy with which she was received. She had a rare gift of letter writing, and corresponded regularly with her many friends up till the last. A woman of great personality, in the opinion of Sir Arthur Keith she inherited to a remarkable degree the features of body, face, and mind of her distinguished ancestor. At the Hunter Centenary Dinner of the College of Surgeons last year she was an honoured guest, and she was an honorary member of the Hunterian Society of London.

THE Chadwick Trustees invite "British subjects between 25 and 30 years of age, who have graduated in a British university or who can produce evidence of attainments or of intellectual equipment proving themselves to be capable of methodical study and research," to apply for two Travelling Scholarships of £400 each to enable the holders to travel abroad during one year to study methods adopted in other countries for the prevention of disease and the improvement of the public health. At the discretion of the Trustees the scholarships may be renewed for a second year. Before appointment a candidate will be invited to submit for the approval of the Trustees a scheme of study and an itinerary which it is proposed to follow. This opportunity is offered to male and female candidates.

ENDOWED DREADNOUGHT BEDS.—Sir George Hume, M.P., recently unveiled a bed in the Dreadnought Seamen's Hospital at Greenwich, the ninth which has been endowed by the Seamen's Hospital Aid Committee in memory of the men of the merchant service who died during the late war. The remainder of the 12 beds in the Northumberland Ward will shortly be endowed through the efforts of the Aid Committee; the Millwall Football Club has promised to endow one of them.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, March 5th.—8 P.M., PATHOLOGY. Laboratory Meeting in the Pathological Department, St. Thomas's Hospital Medical School, S.E. Communications: J. Bamforth: Two Cases of Purpura with Unusual Blood Pictures for which Splenectomy was Performed. R. J. V. Pulvertaft: Experiments with Streptococcal Toxin and Hæmolysins. J. O. Oliver: Group Complement Fixation with the Gram-negative Cocci. 8.30 P.M., ORTHOPÆDICS. Discussion on the Diagnosis and Treatment of Low Back Pain. Opener: Dr. M. Smith-Petersen (Boston, U.S.A.). To be followed by Sir Robert Jones, and others.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Demonstrations: Mr. C. J. S. Thompson will show an unknown portrait of Ambroise Paré. The President will show other portraits of Ambroise Paré. Paper: Dr. R. Campbell Thompson: Assyrian Remedies for Diseases of the Ears. 5 P.M. (at the Middlesex Hospital, W.), SURGERY. (Tea will be served at 4.30 P.M.) Paper: Prof. Sidney Russ: Some Principles of Dosage in Radium Therapy. A demonstration of cases treated with radium by the surgeons of the Middlesex Hospital will follow.

THURSDAY.—8.15 P.M., TROPICAL DISEASES. Paper: Mr. T. W. M. Cameron: Some Parasitic Problems in the British West Indies.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) Cases will be shown demonstrating diseases of the endocrine glands. 5 P.M., OPHTHALMOLOGY. Clinical Meeting at the University College Hospital, Gower-street, W.C. (Tea at 4.30 P.M.)

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

WEDNESDAY, March 6th.—9 P.M., Dr. H. W. Barber: Dermatology in Relation to Other Branches of Medicine. (Third Lettsomian Lecture.)

HUNTERIAN SOCIETY.

MONDAY, March 4th.—9 P.M. (in the London Mansion House), Prof. A. W. Sheen: Some Aspects of the Surgery of the Spleen, illustrated by lantern slides. (Hunterian Oration.)

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

MONDAY, March 4th.—8 P.M., Sir Thomas M. Legge: Thirty Years' Experience of Industrial Maladies. (Third Shaw Lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, March 5th.—5 P.M., Dr. J. Graham Forbes: Past and Present Diphtheria in England and Wales with special reference to the London Metropolis. (Last Milroy Lecture.)

THURSDAY.—5 P.M., Prof. E. B. Verney: Polyuria. (First Goulstonian Lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, March 4th.—5 P.M., Mr. C. E. Shattock: Specimens Illustrating Diseases of the Tongue and Lips.

FRIDAY.—Prof. Sir Arthur Keith: The Anatomy and Pathology of "Diverticulitis."

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, March 4th to SATURDAY, 9th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., at 5 P.M., Lecture by Mr. Herbert J. Paterson: Pitfalls in Radiology.—ST. MARK'S HOSPITAL, City-road, E.C., on Thurs., at 5 P.M., Demonstration by Mr. E. T. C. Milligan: Diseases of the Rectum.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C., Wed., at 4 P.M., Demonstration by Dr. S. A. Henry: The Industrial Cancers and their Importance in the Investigation of the Problem of New Growth.—The above are free.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Post-graduate course in Dermatology, every afternoon, and some evenings.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Post-graduate course in Diseases of Children, mornings only. Lectures, demonstrations, operations. Further particulars from the Secretary, Fellowship of Medicine.

EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.

WEDNESDAY, March 6th.—4 P.M., Cases will be demonstrated by the Honorary Staff. Tea will be served at 3.45 P.M.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, March 5th and THURSDAY.—5 P.M., Dr. A. C. Roxburgh: Cutaneous Syphilis.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, March 4th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Adie: Progressive Muscular Atrophies.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Neurosyphilis.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Postures and Gaits.

FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Neurological Complications of Specific Fevers.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, March 4th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, March 5th.—3.15 P.M., Dr. C. C. Beatty: Hæmaturia.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, March 7th.—4 P.M., Dr. Nabarro: Points in Connexion with Tuberculosis.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

MONDAY, March 4th, WEDNESDAY, and FRIDAY.—5.30 P.M., Dr. A. Maitland Ramsay: The Eye in General Medicine.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, March 4th.—5 P.M., Mr. P. Eggleton: The Chemistry of Muscle Contraction.

TUESDAY.—5.30 P.M., Prof. Karl Pearson: The Heredity of Albinism.

FRIDAY.—5.30 P.M., Dr. J. Howard-Jones: The Hygiene of the Mercantile Marine. (Third Lecture.)

NATIONAL COUNCIL FOR MENTAL HYGIENE, 78, Chandos House, Palmer-street, S.W.

WEDNESDAY, March 6th.—5 P.M. (at the Medical Society of London, Chandos-street, W.), Dr. Bernard Hart: The Minor Mental Disorders of Everyday Life.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, March 5th.—4.15 P.M., Dr. D. E. Core: Dreams.

FRIDAY.—4.15 P.M., Dr. F. E. Tylecote: Demonstration of Medical Cases.

ANCOATS HOSPITAL, POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, March 7th.—4.15 P.M., Dr. Kletz: Diseases of the Gall-bladder.

UNIVERSITY OF MANCHESTER (Chemistry Theatre).

WEDNESDAY, March 6th.—5 P.M., Prof. A. V. Hill: Maintenance of Life and Irritability in Isolated Animal Tissues. (Ludwig Mond Lecture.)

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, March 8th.—3.30 P.M. (at the Royal Hospital) Mr. F. Wilson: Surgical Cases.

Appointments.

HOWELL, T. J., M.D. Edin., has been appointed Assistant Ophthalmic Surgeon to the Royal Victoria Hospital, Folkestone.

MAURICE-WILLIAMS, H. C., L.R.C.P. Lond., M.R.C.S., D.P.H., Deputy Medical Officer of Health, County Borough and Port, Southampton.

SOURASKY, A., F.R.C.S. Edin & Eng., Ophthalmic Surgeon to Out-patients, Hampstead General and North-West London Hospital.

St Thomas's Hospital: THWAITES, J. G., M.B., B.S. Lond., JONES, IVOR, M.B., B.S. Lond., PICKERING, G. W., M.R.C.S., L.R.C.P. Lond., BELL, A. D. C., M.R.C.S., L.R.C.P. Lond., STEWART, H. H., M.B., B.Chir. Camb., BARRETT, N. R., M.B., B.Chir. Camb., DRAKE-LEE, W. G., M.B., B.Chir. Camb., and STORRS, G. S., M.B., B.Chir. Camb., Casualty Officers and Resident Anæsthetists; SAVILLE, J. E., M.B., B.S. Lond. MORTON, T., M.B., B.S. Lond., ELKINGTON, J. ST. C., M.B., B.Chir. Camb., and TROWELL, H. C., M.B., B.S. Lond., Resident House Physicians; FARMER, A. P., M.B., B.S. Lond., Resident House Physician (for Children); HARPER, R. M. J., B.M., B.Ch. Oxf., HILL, R. A., M.B., B.S. Lond., REID, R. W., M.B., B.S. Lond., STEVENS, T. R., B.A., M.B., B.Chir. Camb., COTTON, O. J. C., M.R.C.S., L.R.C.P. Lond., WILCOX, R. N., M.R.C.S., L.R.C.P. Lond., and GUSTERSON, F. R., M.R.C.S., L.R.C.P. Lond., Resident House Surgeons; GEORGE, J. B., M.R.C.S.,

L.R.C.P. Lond., and GILLETT, F. H., M.B., B.Chir. Camb. Obstetric House Physicians; DAVIES, T. E., M.B., B.S. Lond., B.Sc., M.B., B.Ch. Wales., and PALMER V. E., M.R.C.S., L.R.C.P. Lond., Ophthalmic House Surgeons; DRACUP, R. C., M.B., B.S. Bombay, D.P.H., D.T.M. & H. Camb., CLIFTON, F., M.R.C.S., L.R.C.P. Lond., MARRINER., H. I., F.R.C.S. Edin., MARKS, D. P., B.A., M.B., B.Chir. Camb., SEMPLE, J. E., M.R.C.S., L.R.C.P. Lond., NEILSON, D. F. A., F.R.C.S. Eng., FITZGIBBON, G. M., M.B., B.S.Lond., NEGUS, T. H., M.R.C.S., L.R.C.P. Lond., WHEATON, C. E. W., M.R.C.S., L.R.C.P. Lond., BARRON, H. T., M.D. Lond., BEVAN, A., M.D. Lond., HARRISON, G. F., M.R.C.S., L.R.C.P. Lond., RUSSELL, A. S. D., M.R.C.S., L.R.C.P. Lond., LLOYD WILLIAMS, P., M.R.C.S., L.R.C.P. Lond., L.D.S., PENROSE, L. S., M.B. Camb., PURVIS, R., M.R.C.S., L.R.C.P., VAUGHAN-BRADLEY, J., M.R.C.S., L.R.C.P.Lond., NICORY, C., M.R.C.S., L.R.C.P. Lond., LART, J. F. V., M.R.C.S., L.R.C.P. Lond., LANKESTER, L. W. A., M.R.C.S., L.R.C.P. Lond., MAYNARD, R. A., M.R.C.S., L.R.C.P. Lond., MORTON, A. D., M.R.C.S., L.R.C.P. Lond., TAYLOR-YOUNG, H. S., M.B., B.Chir. Camb., HALLETT, D. B. I., M.A., B.M., B.Ch. Oxf., HOWE, E. G., M.B., B.S. Lond., D.P.M. Lond., MCLAUGHLIN, A. I. G., M.B., Ch.M. Sydney, GRIFFITH, D. R., M.R.C.S., L.R.C.P. Lond., SIMONDS, W. H., M.B., B.Chir. Camb., WALTON, L. H. F., M.R.C.S., L.R.C.P. Lond., WALLIS, A. S., M.R.C.S., L.R.C.P. Lond., BROCKMAN, E. P., M.B., M.Chir. Camb., GIBSON, J. M., M.R.C.S., L.R.C.P. Lond., HAMLIN, H. S., M.R.C.S., L.R.C.P. Lond., JOBBINS, C. G., M.R.C.S., L.R.C.P. Lond., ALBURY, M., M.B., B.Chir. Camb., LIMBERY, I. B., M.R.C.S., L.R.C.P. Lond., WILLCOX, G. W., M.B., B.Chir. Camb., RICHARDS, W. G., M.R.C.S., L.R.C.P. Lond., and LEVY, A., M.R.C.S., L.R.C.P. Lond., Chief Assistants and Clinical Assistants.

Certifying Surgeons under the Factory and Workshop Acts: GRAHAM-YOOLL, R. W., M.B., Ch.B. Edin. (West Linton, Peebles); GREGORY, C. H., M.D., B.Chir. Camb. (Rugby); STEPHEN, W. S., M.B., Ch.B. Glasg. (Drummore, Wigtown); WATTHEWS, J. W., M.B., Ch.B. Edin. (Holmfirth, West Riding); WAKELEY, L. S. P., L.R.C.P. Lond., M.R.C.S. (Welwyn, Herts.).

Vacancies.

For further information refer to the advertisement columns.

Bedfordshire County Council.—Asst. M.O. £600. Also Asst. County Dentist. £450.

Birmingham, Ear and Throat Hospital.—2nd and 3rd. H.S. Each at rate of £150.

Birmingham, Queen's Hospital.—Anæsthetist, H.P.'s., H.S's., and Cas. H.S. Each at rate of £70.

Bootle Borough Hospital.—Jun. M.O. At rate of £125.

Brighton, Royal Sussex County Hospital.—Hon. Clin. Asst. to Ear, Nose and Throat Department.

Bristol General Hospital.—H.P.'s., H.S.'s., Res. Obstetric Officer. Also Cas. H.S. Each at rate of £80.

Bury Infirmary.—Third H.S. At rate of £150.

Calcutta, Presidency General Hospital.—Res. M.O. Rs.1.000.

Chester, East Lancs. Tuberculosis Colony, Barrowmore Hall, Great Barrow.—Asst. M.O. £250.

Chester Royal Infirmary.—H.P. At rate of £120.

Coventry and Warwickshire Hospital.—Res. H.P. £125.

Derby, Derbyshire County Sanatorium, near Chesterfield.—Res. Asst. M.O. £350.

Derby, Derbyshire Education Committee.—Asst. School M.O. £600.

Durham County Council Education Department.—Asst. Oculist. £600.

Durham County Council and Chester-le-Street Urban District Council.—District Tuberculosis M.O. and M.O.H. £700.

Essex, Administrative County of.—Asst. County M.O.H. £600.

Fulham Hospital, St. Dunstan's-road, Hammersmith, W.—Part Time M.O.

General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.

Hastings, Royal East Sussex Hospital.—Pathologist. £200. Also M.O. to V.D. Department, £375. Also Hon. Asst. Physician.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also H.S. and H.P. At rate of £100.

Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.

Hostel of St. Luke, 14 ,Fitzroy-square, W.—Res. M.O. £200.

Jerusalem, St. John Ophthalmic Hospital.—Sub-Warden.

Kensington, Fulham, and Chelsea General Hospital.—Hon. Phys. for Diseases of Skin.

King's College, Hospital Denmark Hill, S.E.—Hon. Anæsthetist.

Leeds, St. James' Hospital.—H.P. and S. £200.

Liverpool County Borough.—Jun. Asst. School M.O. £600.

Leicester, Royal Infirmary.—H.S., Res. Cas. O. Also H.P. Each £125.

Lewisham Hospital, High-street, S.E.—Radiographer. £300.

London Temperance Hospital, Hampstead-road, N.W.—Hon. Anæsthetist.

Manchester, Ancoats Hospital.—Res. Surg. O. Also H.S. At rate of £100.

Manchester Ear Hospital.—Non. Res. H.S. Also H.S. At rate of £150 and £120 respectively.

Manchester, Royal Children's Hospital.—Two Asst. M.O.'s. Each at rate of £150. Also Res. M.O. and Res. Surg. O. Each at rate of £125.

Manchester, Salford Royal Hospital.—H.S. to Orthopædic Department. Also H.S. Each at rate of £125.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. At rate of £150.

Northampton General Hospital.—Two H.S.'s. Also Asst. H.S. Each at rate of £150.

Nottingham, Bagthorpe Institution and Infirmary.—Res. Asst. M.O. At rate of £300.

Nottingham, Broadgreen Sanatorium.—Asst. Res. M.O. £250.

Oldham Poor Law Institution, Rochdale-road.—Res. Asst. M.O. £200.

Oxford, Pembroke College.—Theodore Williams Medical Scholarship. £100.

Paddington Green Children's Hospital, W.—Hon Physician. Also H.P. and H.S. Each at rate of £150.

Richmond, Surrey Royal Hospital.—Sen. H.S. Also Jun. H.S. At rate of £150 and £100 respectively.

Royal Free Hospital, Gray's Inn-road, W.—Cas. Officer. £150. Also Res. Anæsthetist.

Royal London Ophthalmic Hospital, City-road, E.C.—Surgeon to Ear, Nose and Throat Department.

Royal Society of Medicine, 1, Wimpole-street, W.—William Gibson Research Scholarship. £292.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

St. Thomas's Hospital, S.E.—Asst. Surgeon in Orthopædic Dept.

Salford, Ladywell Sanatorium.—Asst. Res. M.O. £350.

Shanghai Municipal Council, Public Health Department.—Asst. Pathologist. Taels 650 per mensem.

Swansea Hospital.—H.S. £150.

Tunbridge Wells and Counties General Hospital.—H.S. £160.

Walsall, General Hospital.—Sen. H.S., H.S. Also Jun. H.S. At rate of £200, £125, and £100, respectively.

West London Hospital, Hammersmith-road, W.—Hon. Asst. Anæsthetists.

Willesden General Hospital, Harlesden-road, N.W.—Clin. Asst.

Wolverhampton, Royal Hospital.—Two Cas. O.'s and Anæsthetists. Each at rate of £125.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Hook Norton (Oxon.), Midsomer Norton (Somerset), Tadley and Baughurst (Hants), and Somercotes (Lincs).

Births, Marriages, and Deaths.

BIRTHS.

FORD.—On Feb. 22nd, at a nursing home, the wife of R. Kelson Ford, M.D., Fulwood Union Hospital, Preston, of a son.

JERWOOD.—On Feb. 18th, at Catmos, Wainwright-road, Altrincham, the wife of Bernard Jerwood, M.D., of a daughter.

LANGDALE-SMITH.—On Feb. 17th, the wife of Dr. H. G. Langdale-Smith, Stechford, Birmingham, of a dughter.

RICH.—On Feb. 15th, at Carlton House, Herne Hill, the wife of E. R. Rich, L.D.S. Eng., of a son.

ROLLER.—On Feb. 23rd, at a nursing home, to Caroline, wife of Roy E. Roller, M.C., of a daughter.

SHELDON.—On Feb. 22nd, at a nursing home, Southport, the wife of Harold Sheldon, M.D., 14, Albert-road, Southport, of a son.

WELLS.—On Feb. 15th, at Belvedere, Danbury, Chelmsford, the wife of Dr. J. Pascoe Wells, of a son.

MARRIAGES.

PLANT—HOLE.—On Feb. 13th, at St. Alban's Church, Streatham Park, S.W., Alfred Beresford Plant, M.R.C.S., L.R.C.P., to Marjorie Hole, elder daughter of Mr. and Mrs. R. Hole, of Sayers Common, Sussex.

DEATHS.

BATHE.—On Feb. 15th, at his sister's residence, "Bloomfield," Blackmore-road, Malvern, Allan Arthur Bathe, M.A., M.B. Oxf., in his 60th year.

BENSON.—On Feb. 21st, at St. Anne's-crescent, Lewes, George Vere Benson, M.A. Camb., Barrister-at-Law, M.R.C.S., L.R.C.P., late Coroner for East Sussex, aged 81.

BURRELL.—On Feb. 24th, Lionel Cottingham Burrell, M.A., M.B., M.R.C.S., L.R.C.P., of Arlarie House, Wansford, Peterborough, and late of Kew, Surrey.

KIDD.—On Feb. 21st, at Peak View, Rondebosch, Cape Town, Walter Aubrey Kidd, M.D., F.R.S.Ed., late of Blackheath, aged 76.

MOLONY.—On Feb. 20th, at Kerman, Persia, of enteric, E. F. Molony, M.R.C.S., L.R.C.P., Missionary, C.M.S.

PITT.—On Friday, Feb. 22nd, at Walton-on-Thames, of pneumonia, after five days' illness, George Newton Pitt, O.B.E., M.D., F.R.C.P., aged 75.

STEWART-SANDEMAN.—On Feb. 22nd, at Waverley-place, Aberdeen, of pneumonia, Laura Stewart-Sandeman, M.D., aged 67 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2 2 0
	Six Months	1 1 0
	Three Months	0 10 6
ABROAD	One Year	2 10 0
	Six Months	1 5 0
	Three Months	0 12 6

Notes, Comments, and Abstracts.

THE BABIES' CLUB.

THE first annual general meeting of the Babies' Club was held at 29, Hyde Park Gate, lent by Lady Jones, on Feb. 26th. Mrs. William Piercy presided, and explained that the club, which is situated at 35, Danvers-street, Chelsea, came into being because a few mothers with young children, who had acted as helpers at infant welfare centres, desired to have the same sort of help and guidance in keeping their children well as was available for the poor. Mrs. Stanley Robinson said the founders of the club had realised that the trained medical assistance wanted by the mothers could not be obtained from their family doctors, who were too busy to give up the necessary time. It was decided to found a clinic where, on a single half-day in the week, an expert medical man would be able conveniently to deal with a number of healthy babies, and at the same time avoid encroaching on the domain of the family doctor. Any mother wishing to bring her child to the club had first to inform her family doctor of her intention and obtain his coöperation. The object of the club was the prevention of ill-health and cases of illness discovered by the medical officer were referred to the subscriber's family doctor. The first year's working showed a deficit of £458, but the membership had increased from 9 at the opening of the club in November, 1927, to 70 at the present date. It was hoped that the second year would see the club well on the way to being self-supporting. Each member paid five guineas a year, but a Samaritan Fund had been started to assist those who could not afford this sum.

Dr. H. K. Waller, medical officer of the club, said he found the same sort of minor ailments among the babies seen there as those found at an infant welfare centre in the East End; they were largely ailments due to faults of hygiene, ventilation, clothing, and the like. In some respects the poor mothers had gone ahead, and had remedied faults of management and feeding still found among the Chelsea babies by the time they reached the club. The East End mothers were experts; babies were their one great subject of discussion in their door-step parliaments, and they were quicker to note little points about their babies and to pick up hints offered than middle-class mothers. Dr. Waller had met with keen coöperation on the part of the nurses. English nurses were noted the world over for devotion to their charges, but there were a few rigid customs, in regard to such matters as clothing and ventilation, for example, which might be improved upon. The club was a centre for preventive medicine. It was not possible to prevent all illness, but it was hoped that, equipped with the armour of health, children would be better able to fight their inevitable illnesses.

Miss E. Raynham Smith, the matron, described her work as the first health visitor visiting in middle-class homes. By request she had started a class of instruction for expectant mothers, and applications for help in the most varied situations had been asked for and willingly given.

Sir Thomas Horder said this was a momentous and would indeed be an historical meeting if this first infant welfare centre for subscribing members proved to be a success. He was impressed by the fact that before starting the Babies' Club the committee had approached the Council of the British Medical Association in a spirit of courtesy. The B.M.A. must not be confused with the General Medical Council. It was an association of medical men existing largely to deal with questions in which the privileges and efficiency of general practitioners were concerned. The Babies' Club found that the Council of the B.M.A. was favourable, as far as any official organisation was able to be towards a new effort, and it gave the club its blessing. When, however, this blessing was presented for ratification to the Representative Body at the annual general meeting of the B.M.A. at Cardiff last summer, it was removed, though no ban was placed upon such clubs. Sir Thomas thought that he would sooner have the approval of the Council than of the Representative Body of the Association. In expressing his appreciation of the work done by the Babies' Club, he felt himself to be in good company, since the members had been addressed in their series of lectures by such leaders of the medical profession in matters of infant care as Dr. H. C. Cameron, Dr. David Forsyth, Dr. Allan Hamilton, Colonel R. McCarrison, Dr. Eric Pritchard, and Mr. George Waugh. This was an adventure, and a glorious adventure, and there were many other aspects of medicine, economics, and sociology which might have to be tackled on similar lines. Instinct did not carry people very far; education was essential. Sir Thomas Horder was impressed by the safeguards incorporated in the club's rules; against any infringements of the rights and privileges of general practitioners the family doctor was an essential part of the scheme. The results of the first year's working more than justified what the Committee had set out to do.

STANDARDISED YEAST.

YEAST is now recognised as a therapeutic agent, and its purity and activity should therefore be standardised. With this object the Standard Yeast Company, of Church-street, Chiswick, London, W., have laid down an elaborate plant for the production of pure yeast. The plant is a large one, capable of producing 15 tons in 24 hours; three chemists and five assistants control the process, and at each stage in the production the work is done under strict sanitary conditions. A single yeast-cell is picked out under the microscope, and placed in a Petri dish on agar-agar. The culture thus obtained is transferred to Erlenmeyer flasks containing sugar, thence again to tanks of increasing size containing sugar and phosphates. The largest tank has a capacity of 85,000 gallons. During the process the yeast is agitated by filtered air, the object being to separate the budding cells of the yeast from the parent, so as to quicken the growth. Subsequently the yeast is separated from the alcoholic wash (which, owing to the special process employed, contains only a negligible amount of alcohol), and is conducted through pipes to the pressing rooms. After passing through press filters it is ready to be made into tablets, which are sold under the name of Lyco Pure Yeast tablets. We understand that the beet-sugar used in feeding the yeast is carefully purified before use, and that during their formation and packing the tablets are not touched by the hands of the employees, every precaution being taken to avoid contamination. The whole of the plant is washed out once a week. An analysis of the tablets which has been supplied to us states that they consist entirely of pure pressed yeast, and weigh 0·305 g. each (about grs. 4½). Each tablet is stated to contain over 50,000,000 living yeast-cells and about the same number of dead cells. If yeast is to be given therapeutically it is certainly advantageous to use a pure culture, and the Standard Yeast Company's tablets appear to be satisfactory in this respect.

INFECTION OR INTINCTION.

To the Editor of THE LANCET.

SIR,—I shall be greatly obliged if those of your medical readers who are willing that their names shall be appended as signatories to the subjoined petition will signify the same to me as soon as possible by letter or postcard; also those who are willing to get petition forms signed. My profession awaits a lead from theirs.

"We, the undersigned registered medical practitioners, as Guardians of the Public Health, deem it our duty to petition all with whom the decision rests to discontinue the present method of administering the consecrated wine in the Holy Communion by means of a common cup as calculated to spread disease."

I am, Sir, yours faithfully,

S. CLAUDE TICKELL,
Vicar of Latton-cum-Evsey, Cricklade;
Hon. Secretary, Association for Avoidance of
Feb. 10th, 1929. Infection by Intinction.

A KING'S PHYSICIANS.

To the Editor of THE LANCET.

SIR,—Recent events have brought up in my mind a doggerel rhyme heard in childhood. Unfortunately I have it in a fragmentary condition and should be grateful if you could complete it and date it.

"Physicians attend His Majesty daily—
——, ——, Heberden, and Bailey;
All of them very excellent men—
——, ——, Bailey, and Heberden."

What two colleagues signed bulletins with Dr. Heberden and Dr. Bailey? And for what sovereign? The recollections of my grandmother, from whom I learned the verses, might go back to William IV., but I think the episode belongs to an earlier reign.—I am, Sir, your faithfully,

FRANCIS C. WALKER.
University of British Columbia, Jan. 28th, 1929.

THE COST OF SCIENTIFIC BOOKS.

IN the last number of his *Quarterly Review of Biology* (iii., 600) Prof. Raymond Pearl has an interesting analysis of the cost of biological books in 1928 based on the volumes sent to that journal for review. The average prices in cents per page, and the percentage difference from the 1926 figures, are:—

	Cents per page.	Difference from 1926
England	1·09	—15 per cent.
United States	1·14	+ 2 ,,
Germany	1·48	+36 ,,
France	0·45	+29 ,,
British Government	1·26	—
U.S. Government	0·21	—32 ,,

Such data are no doubt subject to many qualifications; but it is evident that French books are very cheap and German books are dear. The day of cheap blue-books full of useful scientific information seems also to have passed in this country.

An Address

ON THE

RÔLE OF STARVATION IN TREATMENT.

Delivered before the Medical Society of London on Jan. 28th, 1929,

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IN the history of living organisms as a whole starvation, partial or complete, is a common experience. It is one of the chief dangers to be avoided by every sentient being. The human race has been occupied through the ages in acquiring a degree of command over the forces of nature in order to avoid this danger, and has developed a power of preparing, storing, and transporting food. This provision has been followed by a growing social sense that the destitute and the famine-stricken should be relieved, in respect of food at least, by more fortunate individuals or communities, and up till 15 years ago we should have said that natural starvation was becoming eliminated from human affairs. Since then we have witnessed and shared in the undernutrition of millions, and a new opportunity has been afforded of studying, with modern scientific knowledge and methods, the age-long phenomena of semi-starvation. In normal times, however, and in civilised communities there is probably more danger to health from over- than from under-nutrition, and there are many diseased states for which the withdrawal, for a time at least, of all or some of the food is beneficial.

Starvation may be defined as the lack of any or all of the elements needed for nutrition. It has been said that a strong man can do without oxygen for a few minutes, without water for a few days, and without food for a few weeks. We are here concerned with deprivation of food only, water being freely supplied.

The first symptom of starvation is hunger, which is associated with a sensation, which may be painful, in the epigastrium. It arises after the stomach has been empty some time, as the human race has always known, and as Beaumont[1] observed experimentally in Alexis St. Martin. The observations and cogent arguments of Cannon and Washburn[2] seem to establish that, as suggested by Weber in 1846, it is associated with strong contractions of the stomach which, like the sensations of hunger, are intermittent and pass off[3] after two or three days of complete fasting. Hunger is felt by people with no hydrochloric acid in the gastric juice. There is, however, a sense of need for food in starved people who complain of no pangs of hunger, for they tend to think and dream of food; but accompanying symptoms—such as lassitude, drowsiness, faintness, headache, and restlessness—are absent in many subjects, and vary with the individual. The pangs of hunger are not a manifestation of the general need of the cells of the body, because they cease long before the cells are starved, indeed when the blood, as we shall see, is carrying more food to them than usual; and they are relieved at once by putting food into the stomach, before assimilation can have proceeded far, or even by ingesting that which is not food. Appetite is in some degree independent of hunger, for we can desire and enjoy foods we like when we are not really hungry.

CLINICAL FEATURES OF EXPERIMENTAL FASTS.

In complete starvation the individual lives on his own tissues. Loss of weight is rapid at first, but soon reaches a regular rate varying with the store of fat, the fatter person losing more slowly, because each unit of fat gives ten times as much energy as the same weight of protein flesh. The body naturally conserves its energies, using fewer calories; the subconscious restriction of movement of a starving person is obvious to the onlooker. Rest lessens the expenditure, and the usual loss of weight in the later stages in subjects mainly resting is about one pound a day. The pulse becomes slower and the blood pressure falls. In Benedict's subject, who fasted 31 days, it was 132 mm. of mercury at the beginning and 116 at the end. In Cathcart's[4] subject it fell from 108 to 88 in a fortnight. Lower figures were observed by Rostoski[5] during a hunger strike of prisoners of war, the systolic pressure in one subject being recorded as 55 mm. The temperature remains almost constant in prolonged fasts, falling, for example, only 0·3° and 0·16° in two subjects, until the approach of death. No impairment of the mental state has been observed in experimental subjects. Some profess to be more able when fasting. In so far as they are relieved from the turgidity of a laboured digestion and the effects of alcohol and tobacco this is probably true, and tests in Benedict's case showed that the subject was at least as capable when fasting. Fasting men are not able to do more muscular work and their power of endurance is not increased. Healthy men and dogs have survived long fasts without any recognisable lasting evil effects. The power to fast and remain efficient differs greatly in different persons. Most of the experimental subjects complain of no symptoms. Cathcart's subject, a professional faster, aged 31, complained of headache and malaise on the fourth day, but this passed off. On the twelfth day he felt weak and giddy on quick movement. This was the subject whose blood pressure fell below 100. He remained in bed on the last two days of the fortnight's fast.

Fasting animals are more liable to contract an acute infection to which they are exposed and less able to resist the disease when contracted; experience teaches that the same applies to man. Warmth increases the resistance to inanition, but fever diminishes it. With partial feeding the period of resistance is much extended. A man can starve for a short period only, but he can survive being half-starved for a very long time.

In fasting the glandular organs of the body lose most weight, then the muscles, whilst the brain and heart are conserved at the expense of other organs. The following was the actual order of percentage loss of fat-free tissue of various parts of a dog after a fast of 24 days[6]: Pancreas (62 per cent.), spleen, kidney, liver (50 per cent.), genitals, blood, muscle (42 per cent.), stomach and intestine, lungs, skin, brain (22 per cent.), heart (16 per cent.), skeleton, eyes. The secretions quickly diminish, as shown by gastric juice and milk.

BIOCHEMISTRY OF FASTING.

The body as a whole does not starve; it lives on itself. When the mobilisation of its own stores to some essential part fails, then the end comes. This may be, and often is, long before the stores are exhausted, and when food is still being actively transferred to the various organs, as shown by the presence of fat in the body and its excess in the blood at death. The first call is made on the glycogen in the liver. As soon as this is gone, or nearly gone, more protein is used, especially if meat has been eaten recently. The so-called "deposit" or less essential protein is next burned. The body then has to draw on tissue protein and settles down to a minimum ration, getting as much as possible of its energy from fat and as little as possible from tissue. The rate of combustion of protein is followed by determining the nitrogen in the urine, and the amount of tissue protein used can be assessed by watching the excretion of potassium, magnesium, and sulphur. In prolonged fasting the excretion of nitrogen falls to 3 or 4 g. a day. If non-protein food is given it may be even less. Thus in a man with muscular dystrophy on a starch and cream diet I found in the urine on four successive days, 7·2, 3·6, 2·5, and 2·0 g. respectively.[7]

When weight is being lost steadily in partial starvation with a fair supply of protein there is, in some cases at least, a loss of protein tissue as well as

of fat. It is conceivable that this may easily arise by lessening of the glandular organs, even when the muscle tissue, through massage and exercise, was being kept up or even increased.

For example: An elderly man had been on a reduction diet for a month. His obesity, with circulatory embarrassment, had begun from overfeeding for fibroid phthisis which had now been quiescent for many years. The diet contained about 1060 calories (C., 65; P., 67; and F., 56). A test was made of the nitrogenous metabolism for six days by A. J. Leigh, B.Sc. During this period 4¼ lb. was lost, approximately ¾ lb. a day. Both the intake and the output were almost constant day by day.* The excess of the output of nitrogen in urine and fæces over the intake in the food was about 3 g. representing loss of protein tissue. The error of estimation of the nitrogen in food in a mixed diet is considerable, and the loss may have been rather less than that represented by these figures. The patient was feeling thoroughly well, improving in health, and taking more exercise daily.

The main source of energy in starvation is the stored fat, and those who have most bear fasting best and live the longest. About 90 per cent. of the needs are, on the average, supplied from fat. When it is nearly gone, more protein has to be used and there occurs an ante-mortem rise of nitrogen in the urine. The strain on the metabolism of fat leads to some acidosis, which can be shown by a fall of the carbon dioxide in the alveolar air as soon as the second day. Later oxybutyric acid, acetone, and ammonia occur in the urine, though not in the amounts found in severe diabetes. Acidosis was regarded as the cause of the headache and nausea noted by Folin and Denis[8] in fasting fat women; it was relieved at once by toast and tea. With repeated fasting the body becomes able to burn fat more completely without acidosis. A fasting man at moderate work burns more fat, but generally not more nitrogen.

After the glycogen in the liver is used there is little or no carbohydrate to be burned for energy purposes and, with combustion of fat and protein alone, the respiratory quotient falls to about 0·72 or lower. The blood-sugar, however, remains constant; it is needed and is formed from tissue protein, and probably from fat.[9] The essential carbohydrate metabolism is conserved to the end. Indeed, glycogen disappears entirely in an animal only after convulsions, and even then speedily reappears. Hypoglycæmia such as can be produced by insulin is not a natural phenomenon.

The energy needs of the body are, as above-mentioned, reduced as much as possible. For example, a man of 70 kilos (11 st.), who would burn material in a sedentary life to produce 2500 calories a day, will use 1800 calories in the first days of fasting and 1700 at the end of a week, an amount very near to his minimum requirement of 1600 calories. The blood tends to be a little more concentrated in non-protein nitrogen, including urea and uric acid and globulin,[10] and contains a good deal more fat, which is being carried to those parts which need it most. Its sugar content remains at a normal level. Anæmia is usually absent. It is hardly correct to speak of purification of the blood in fasting. The stream is rather in the condition of a highway along which such changes as there are are in the direction of mobilisation to meet a threatened danger. Depletion is of the glandular organs rather than of the blood. After a few days the urine of fasting men and animals commonly contains albumin. Bacteria continue to live in the intestinal secretions when all food is withheld at least a month. Lusk mentions that of 131 colonies taken from the stool of a subject who had fasted for 30 days, 110 yielded *Bacillus coli*, 17 *Micrococcus alveolus*, and 4 *Bacillus mesentericus*. He remarks that it does not appear to be possible to sterilise the intestinal tract or starve out bacteria from it.

Ancient Customs.

Fasting has been practised as a self-denying, ascetic, purifying, or religious exercise as far back as history goes. Among savage tribes the ability to fast was no doubt a large factor in eliminating the unfit. Fasting, perhaps on that account, was often regarded as a virtue; and there can be no doubt that the practice of total or partial periodical abstinence has been and may be of both physical and mental benefit. Although the so-called "hunger-artists" who have fasted under scientific observation in recent times have not manifested delirious or ecstatic phenomena, yet we find again and again in history that fasting has been used, as it is still, to induce a state of exaltation in which the subject sees visions and dreams dreams. Since prolonged and complete fasting is not associated as a rule with hunger, the feeling arises that the spirit is sublimated and independent of the body. He feels cleaner, freed of base desires, a better being in body and spirit; and a special authority has been ascribed to ideas, rhapsodies, or messages conceived, inspired, or delivered at such a time by medicine-men, fakirs, prophets, seers, and saints. Dr. Josiah Oldfield gives interesting examples from various races and periods.[11]

War-time Experiences.

During the war the supply of food to the Central Powers fell much below that necessary to nourish the people. Careful studies have been made, both in Austria and Germany,[12 13] and the scientific work of the previous generation as to the needs of the body was in all respects fully confirmed. In many parts of Germany, instead of a ration of 2400 calories and upwards, the food supplied extended only to 1300 to 2000 calories. The protein, vitamins, and mineral substances were generally in sufficient amount, the shortage being of carbohydrate and particularly of fat. It was found that in the early months sufferers from diabetes and gout improved in health and many of them ceased to need medical advice. Obesity was naturally also much benefited. The lack of food, however, led to severe under-nutrition, and it was said that there was hardly a poor person in Berlin who weighed more than 8 st. This wasting was accompanied by lowered efficiency and less resistance to disease. Nervous disorders began to arise; tuberculosis was rife and progressive, and anæmia became common. Patients with myxœdema did badly. The infectious diseases, such as influenza, appeared to be more severe, and it was particularly difficult to secure proper nutrition during convalescence, which was therefore prolonged and incomplete. Chronic diarrhœas and digestive diseases were adversely affected. This, no doubt, depended partly on the quality of the food, which was mainly vegetable, as well as on the deficiency in nutritive value. The medical opinion based upon the experience of a whole nation becoming largely vegetarian did not favour that régime as a permanent diet. The disease known as hunger œdema was perhaps partly due to taking so much salt to flavour the somewhat tasteless food and to abundance of water, but as it was most quickly relieved by giving fat, the lack of calories must be regarded as a main factor.

Starvation in Disease.

Complete fasting is beneficial in local diseases of the alimentary canal, such as appendicitis, local peritonitis, and ulceration; indeed, it is more reasonable for alimentary diseases than for any others since the organs of digestion are almost completely rested when the body fasts, whereas the remaining tissues have still their duties to perform. It is wise for this purpose, and indeed for all purposes, not to press the fast too far. The protein metabolism is not reduced to its low fasting value until about the fifth or sixth day, so that fasts for shorter periods do not put the same strain upon the resources of the body. Short complete fasts of one, two, or three days do good in a number of other diseases. On such days the patient will receive abundant fluid, and many medicine-men will allow tea, coffee, and fruit juice, and sometimes strained soup. In some cures a low diet of little milk, bread and butter, and salad is given for a day or two before the fast. After the fast it

* The figures are given in the appendix.

important also to begin the feeding gradually with small quantities of simple foods, such as meal soups, bread, and vegetables. Obesity, diabetes, and plethora are all benefited. Pneumonia and other severe fevers, acute nephritis, chronic uræmia, migraine, hyperthyroidism, and some skin diseases do well with this treatment in selected persons. Good results are also reported in local infections, phlebitis, leukæmia,[14] rheumatic diseases, rickets, and the vomiting of pregnancy; but I have not myself had experience of fasting in all these states. Caution must always be exercised and careful examinations made. Children and the cachectic and tuberculous should not be deprived of food for more than comparatively short periods. Much longer fasts have been employed, especially abroad, in many conditions. The opinion of scientific physicians in the countries concerned is not, however, favourable to them.

The use of starvation in the treatment of epilepsy is of much interest. Guelpa,[15] with Marie, applied his method of fasting and purging in epilepsy with benefit. Geyelin,[16] working with epileptic children, found good was done during the fast, especially when there was acidosis, but that the attacks recurred on resuming a normal diet. Wilder then suggested producing the acidosis without starvation by a diet sufficient in calories but deficient in carbohydrate, with minimal protein and abundance of fat—i.e., a ketogenic diet. Research has shown that it is the ketosis and not the acidosis, as such, which benefits the seizures, for acidosis produced in other ways is not effective. The results of two years' clinical trial were reported upon favourably by Peterman[17] in 1924; and Barborka[18] has recently reported benefit in 19 out of 32 adult patients.

Obesity.

The largest class of persons who benefit from undernutrition comprises those who have habitually taken food in excess of their need—namely, the obese. If obesity is not a disease it is at least an unhealthy state. It is associated with a lessened mobility, a lessened resistance to intercurrent disease, and a tendency to certain maladies, especially diabetes. Fat is due, like a bank balance, to a difference between income and expenditure. It is to be got rid of either by increasing expenditure, through exercise, the use of thyroid, and in rare cases by influencing metabolism with pituitary gland, or by diminishing income—i.e., the intake of food. A reduction of food, if made with due regard to physiological needs, will be successful without any other means, although it can be greatly assisted by the use of thyroid and suitable exercise; whilst the various methods of increasing expenditure will not be successful by themselves unless steps are taken to see that the intake of food is not increased proportionally—that is, unless the diet is controlled. The physical treatments to which patients attach importance, such as massage and baths, do not reduce weight; they are valuable as a means of keeping the muscles and the circulation in a good state during the treatment. Thyroid is a great help, but requires close control. When administered by the patient harm is often done. In all cases a thorough clinical and biological examination of the systems and secretions must be made before a reduction treatment is undertaken.

The obese may be divided roughly into two classes, large eaters and small eaters. The first class includes many able and active people who enjoy their food a little more than is good for them, but do thoroughly well with treatment. It includes also a very small subclass of unfortunate folk whose inability to resist the pleasures of food and drink make them unable to adhere to or profit by careful treatment. Those in the second class are careful as a rule about diet, but since youth have been the victims of their rotundity. These include the cases called endogenous. Only a small part of the food we eat is required for vital functions and movements; most of it goes to keep us warm. The rounder we get the less surface there is in proportion to weight, and the less fuel is required. Every little excess of food, then, goes to increase the roundness and diminish the needs, and so the vicious circle goes on. It follows that if the subnutrition treatment is continued long enough to take off a good deal of weight and alter the conformation of the body, the patient can look forward to eating rather more food later without increase of weight.

Method of Dieting.

The method of reduction which I use is that of giving an ordinary mixed diet, but in quantity lessened by measured steps, always bearing in mind that a certain proportion of protein, providing 6 to 9 g. of nitrogen, is needed daily. The basis of the diet is meat and vegetables, but if the amounts are measured there is hardly any food which may not be allowed—at least in small quantities. In sufferers from constipation meat is almost entirely excluded. It is essential to teach the patient that it is the total caloric value which counts, otherwise he runs away with the idea that some foods are fattening and that others, such as fruit, toast, and biscuits of protein or rye, are not, and that an obese person can be reduced by permitting this and forbidding that, irrespective of amount. The easier way to prescribe a diet is, of course, to give a list of foods to be taken or avoided, and this method is often followed by a measure of success. In many, probably in most, cases, however, if steady consistent results are to be secured, with permanent benefit to health, much work must be done day by day and week by week in measuring and varying the diet and making it conform as far as possible to the patient's own tastes. For if the particular foods given are not reasonably acceptable the diet will be a temporary measure only and will fail of the larger object—namely, to find a régime which he can manage and continue for himself. No fixed or published diet can, therefore, be the most suitable for any individual; his régime must be arrived at by collaboration between the doctor, the dietist, and himself, and it must be varied continually. With this important proviso, the following specimen diets are given as examples of some of the stages. In practice we avoid arithmetic as much as possible by using tables of food values looking rather like a book of logarithms, which have been constructed by my colleague, A. J. Leigh, B.Sc. In these the protein, carbohydrate, fat, and caloric values are worked out for each food, as served at table, in all the quantities likely to be required, in steps of 10 g. An adding machine is used to arrive at totals. The diets shown are roughly of 1300, 1100, 1000, and 600 calories. Different examples are given to show variety in the strictest diet. Almost any number of variants can, of course, be constructed. The figures representing analyses of foods as served are as near the truth as the nature of the work permits. The average error may be taken as ± 5 per cent., but this is small compared with the magnitude of the reductions and variations of the total amounts of food. Moreover, it tends to become less and less if the personnel in the kitchen, diet-rooms, and laboratory is unchanged. The foods are weighed as served on the Chatillon scales, on which the weight of the plate or small dish is automatically deducted by the simple device of a shifting dial.

The patient is allowed to drink water and other suitable fluids freely. The reason for restricting fluid at meals in cases of obesity is that drinking at meals leads to more food being taken. When all the food is measured this no longer applies.

In speaking of the results and of the pitfalls of partial starvation for obesity, it must be remembered that my own experience is almost entirely of cases which had failed to respond to simple measures adopted at home. The loss of weight is most rapid in the first days, and with it there quickly comes, as a rule, the feeling of returning lightness, vigour, and spirits. I formed the impression in earlier days that about the tenth to the fourteenth day a feeling of depression was likely to occur, often attributed by the patient to other causes, such as the weather.

Hunger is not a feature of this state, but a good meal, such as a large chop or whatever the patient prefers, in moderation, will clear it up. Of late years, however, since I have made a practice of warning the patient beforehand, I see this less often. An average loss of a stone a month is ample if permanent good is to be done. Very large flabby people will lose more and smaller harder people only 10 to 12 lb. The greates loss we have seen, excluding cases with dropsy, i 10 lb. in a week. In overweight with ascites an œdema one patient on a reduction and salt-free die lost 23 lb. in one week. Women lose on the averag rather less than men on the same treatment. This i probably because they tend to be shorter and rounde needing, therefore, less food per unit of body-weight

My experience is that it is usually better to giv four meals a day, tea being a very small meal, such a two biscuits with the tea. If hunger is complaine of—and it is surprising how seldom it is—a cup strained beef tea or of Bovril at 11 A.M. or bedtim will relieve without adding many calories. In th uncommon cases in which hunger is insistent it often better to make the breakfast a larger mea It may be repeated that, with the above-describe method, the body is never starving or half-starvin If enough, or nearly enough, nitrogenous food provided, with greens and some carbohydrate, th body supplies almost all its remaining needs from i own stored fat. One might think that acidosis wou develop from the burning of so much fat, but th supply of carbohydrate, which aids the combustio of fat, is generally enough to prevent that, and have not recognised it in any case.

It is unwise ever to attempt to reduce weig except on medical grounds, and it is not a doctor

I.—*Two Examples of Diets at the First Stage—About 1300 Calories.*

Sp. = special—i.e., sugarless (jam or marmalade).

Calories, 1340 ; C., 91 ; P., 86 ; F., 66.

Breakfast.	Grammes.	*Tea.*	Grammes.
Ham	35	Water biscuits	20
Egg	—	Butter	10
Toast	20	Milk	50
Butter	10	Sp. apricot jam	20
Milk	50		
Sp. marmalade	15	*Dinner.*	
Lunch.		Tomato soup	200
Roast beef	60	Fried plaice	50
Carrot	50	Roast pheasant	95
Cabbage	50	Savoy	50
Stewed pears	120	Celery	50
Toast	20	Peaches	120
Butter	10	Toast	10
		Butter	5

Calories, 1340 ; C., 84 ; P., 85 ; F., 69.

Breakfast.	Grammes.	*Tea.*	Grammes.
Fish	70	Water biscuits	20
Poached egg	—	Butter	10
Toast	20	Milk	50
Butter	10	Sp. plum jam	20
Milk	50		
Sp. marmalade	20	*Dinner.*	
Lunch.		Vegetable soup	—
Roast chicken	95	Fish cutlet	40
Turnip	50	Vienna steak	110
Sprouts	50	Artichokes	50
Baked apple	80	Kale	50
Toast	20	Greengages	120
Butter	10	Toast	20
		Butter	10

II.—*An Example of a Diet at the Fourth Stage.*

Calories, 1100 ; C., 77 ; P., 56 ; F., 58.

Breakfast.	Grammes.	*Tea.*	Grammes.
Two eggs (poached)	—	Water biscuits	20
Toast	20	Butter	5
Butter	10	Milk	40
Milk	50	Sp. raspberry jam	15
Marmalade	15		
Lunch.		*Dinner.*	
Roast mutton	33	Vegetable soup	200
Carrot	50	Fried sole	40
Kale	50	Ham pattie	50
Apricots	60	Asparagus	50
Toast	10	Leeks	50
Butter	5	Fresh pear	100
		Toast	10
		Butter	5

III.—*Two Examples of Diets at the Fifth Stage.*

Calories, 1010 ; C., 61 ; P., 63 ; F., 54.

Breakfast.	Grammes.	*Tea.*	Grammes.
Cold ham	17	Water biscuits	20
Egg	—	Butter	5
Toast	20	Milk	40
Butter	10	Sp. apricot jam	15
Milk	50		
Marmalade	15	*Dinner.*	
Lunch.		Clear soup	—
Roast veal	50	Grilled plaice	40
Celery	50	Vienna steak	70
Spinach	50	Cauliflower	50
Stewed apples	60	Onion	50
Toast	10	Loganberries	60
Butter	5	Toast	10
		Butter	5

Calories, 990 ; C., 63 ; P., 64 ; F., 51.

Breakfast.	Grammes.	*Tea.*	Grammes.
Fish	70	Three water biscuits	20
Egg	—	Butter	10
Toast	20	Milk	40
Butter	10	Sp. plum jam	15
Milk	50		
Sp. marmalade	15	*Dinner.*	
Lunch.		Tomato soup	200
Roast beef	40	Fish (baked)	40
Savoy	50	Mutton cutlet	33
Artichokes	50	Celery	50
Rhubarb	60	Sprouts	50
Toast	19	Peaches	60
Butter	5	Toast	10
		Butter	5

IV.—*Four Examples of Diets at the Sixth Stage.*

Calories, 730 ; C., 54 ; P., 48 ; F., 34.

Breakfast.	Grammes.	*Tea.*	Grammes.
Fish (fried)	70	Water biscuits	14
Toast	10	Butter	5
Butter	5	Milk	30
Milk	30	Raspberry jam	15
Sp. marmalade	15		
Lunch.		*Dinner.*	
Roast veal	35	Vegetable soup	—
Celery	50	Vienna steak	50
Spinach	50	Cauliflower	50
Stewed apples	60	Onion	50
Toast	10	Loganberries	60
Butter	5	Toast	10
		Butter	5

Calories, 700 ; C., 51 ; P., 39 ; F., 35.

Breakfast.	Grammes.	*Tea.*	Grammes.
Cold ham	17	Water biscuits	14
Toast	10	Butter	5
Butter	5	Milk	30
Milk	30	Black currant jam	15
Marmalade	15		
Lunch.		*Dinner.*	
Minced steak	50	Tomato soup	—
Savoy	50	Chicken	45
Artichokes	50	Celery	50
Rhubarb	60	Sprouts	50
Toast	10	Peaches	60
Butter	5	Toast	10
		Butter	5

Calories, 700 ; C., 54 ; P., 39 ; F., 34.

Breakfast.	Grammes.	*Tea.*	Grammes.
Poached egg	—	Water biscuits	14
Toast	10	Butter	5
Butter	5	Milk	30
Milk	30	Sp. jam (plain)	15
Sp. marmalade	15		
Lunch.		*Dinner.*	
Roast mutton	25	Clear soup	—
Carrot	50	Grilled fish	70
Kale	50	Brussel sprouts	50
Apricots	60	Cauliflower	50
Toast	10	Stewed pears	60
Butter	5	Toast	10
		Butter	5

Calories, 690 ; C., 52 ; P., 31 ; F., 38.

Breakfast.	Grammes.	*Tea.*	Grammes.
Egg (boiled)	—	Two water biscuits	14
Toast	10	Butter	5
Butter	5	Milk	30
Milk	30	Apricot jam	15
Sp. marmalade	15		
Lunch.		*Dinner.*	
Roast beef	28	Clear soup	200
Cauliflower	50	Mutton cutlet	23
Sprouts	50	Savoy cabbage	50
St. greengages	60	Turnip	50
Toast	10	Fresh pear	90
Butter	5	Toast	10
		Butter	5

work. If a doctor allows a comfortable-looking woman of average height, and weighing 10 or 11 st., to persuade him to let her take a reduction diet because she would like to have a thinner figure, her face will become haggard. She will blame not her vanity but her doctor, and she will be right.

Persons who are really overweight improve in looks and in health steadily. Symptoms seldom arise during treatment, and those formerly present generally disappear. Especially striking is the loss of breathlessness; this is partly because there is less weight to be moved, but is mainly to be ascribed to lessening of fatty tissue among and within the muscle-fibres of the heart. If neuritic pains occur, and especially facial neuralgia or diarrhœa, or a total loss of appetite, amounting to dislike of food, the treatment should as a rule be altered. I have not seen serious weakness or anæmia as a result of treatment. The tendency is for earnest patients to eat less than is reasonable, and to urge the doctor to get quick results; he must in no circumstances yield to such pressure against the patient's interests.

The following case was of exceptional gravity, in both senses, but it responded typically to treatment and illustrates many of the above points.

A man of 30 (No. 1419) sought treatment for obesity, shortness of breath, and lack of energy. A consulting physician had found a quick pulse, with albumin, casts, and a suspicion of sugar in the urine, and had warned him that his state compelled anxiety. He had been fat since the age of 14, and at 20 weighed 16 st. Treatment at various times by diet, exercises, Bergonié chair, thyroid and pituitary extracts, had not arrested the steady increase of bulk.

On admission his weight was 25 st. 11 lb. in his clothes; height 5 ft. 8 in. He had been an energetic business man, travelling a good deal, but had felt lazy of late. Pulse-rate, 88. The physical examination of the heart could not be satisfactory, but nothing abnormal was heard; with X ray it appeared normal. The urine gave a faint trace of albumin. He was treated for a week by a moderate restriction of diet alone—namely, to 1000 calories—with a good deal of rest. On this 3 lb. was lost. The diet was then reduced to 800 calories, and a week later to 700; grs. 5 of thyroid were given twice a day, with massage, and the Bergonié chair was used. He began to lose 5 lb. a week steadily, and after four weeks was allowed to play three holes of golf, adding a hole a day. The treatment was continued with various modifications and alterations for eight and a half months, in which time 11 st. 11 lb. were lost, an average of 4½ lb. a week. This patient went through a sharp attack of bronchitis without causing any anxiety. Occasionally he would feel his heart beating, when the thyroid would be omitted for a time. In the latter part of the treatment he was subject to diarrhœa, and thyroid, greens, and fruit were all omitted.

It is now nine years since he left my care with instructions for the continuance of his régime, as required, under the supervision of his doctor. I have had a letter this month saying that he is well and energetic, and has regained 2 st. only of the 11½ he had lost.

The criterion of real success is that a patient shall not only benefit during his treatment but be able to keep well at home. Of this the above is a good example.

Another instructive case is that of a man weighing 21 st. 4½ lb., who felt his health was failing. He was treated at Ruthin Castle for nearly a month, losing weight steadily. He learnt the régime and then returned to his duties, intending to carry on the dietetic part of it for himself. This he did with success, and 11 months later weighed 12 st. 4½ lb.

It is not always easy to decide whether a case of obesity comes under the exogenous or the endogenous class, but in endogenous cases—i.e., those in which obesity has been present throughout life with no evidence of excessive consumption of food—the treatment and its effects are identical with those of cases classed as due to over-eating, except that the loss of weight may tend to be rather slower.

Single-food Cures.

Many special diets have been and are used for reduction, consisting of one food or of one kind of food; all that are successful necessarily bring about a form of undernutrition. One which has a reasonable basis is a measured milk diet, and in certain cases I employ this for a time, keeping the food value down from 1200 to 600 calories daily. Thus 4 oz. of milk every two hours for eight feeds a day give between six and seven hundred calories of a fairly balanced diet. We sometimes also give an orange day as a change during the régime, but not on a succession of days. Six large Jaffa oranges give 370 calories, mostly derived from over 70 g. of carbohydrate.

The cures I am now speaking of, however, are those in which a single food or single group of foods is continued for weeks at a time. Such single food diets are known as orange cures, grape and other fruit cures, potato and vegetable cures, oatmeal cures, &c. These cures are easy to organise. They are mostly forms of partial starvation, in some of which the necessary nitrogenous matter is not supplied, while in others there is vitamin deficiency. They all have one feature—namely, a time limit; the cure is for three weeks or four weeks, as the case may be. It is indeed essential that there should be a limit, for such unscientific experiments continued too long do serious harm. I have seen this on various occasions. The loss of weight is, for the time, satisfactory and sometimes phenomenal, but as the treatment can have no permanent basis the patient is liable to spend the rest of the year fattening for another cure.

I am convinced from long experience that the right way, laborious as it may be for the doctor and the dietist, is to construct a mixed diet of the required caloric value, altered as may be necessary from day to day, and to send the patient home with a practicable régime which he or she knows by heart, understanding also the principles on which it is founded. The patient must also be made familiar with the amount and form of physical exercise that is suited, not to a few weeks' cure, but to permanent healthy living.

Obesity is often complicated by other disorders and, as a general rule, if the state of the patient allows of treatment by partial starvation, the accompanying disease is benefited. Two conditions especially can nearly always be treated successfully in this way—namely, circulatory disorders and mild glycosuria.

Obesity and Diseases of the Circulation.

The good which can be done in a few weeks to the plethoric fat man, whose life is in danger from heart failure or cerebral hæmorrhage, is remarkable. Some of these cases call for immediate venepuncture and withdrawal of 300 c.cm. of blood, but that is a temporary emergency measure. It is inferior to reduction treatment because it does not deal with the cause—namely, the overloaded metabolism. If such individuals are treated under supervision for a month or two and put into a better way of living, efficiency is re-established, active life is much prolonged, and they are prevented from getting into the same state again. Two examples are given, both of whom did well under treatment. The first man returned to his former habits of life and died suddenly; the second took an opposite course and has kept well.

A man of 57 (No. 1573) complained of excessive weight, morning headaches, weakness, abdominal pain, and anal fistula. His height was 5 ft. 10 in., and his weight 18 st. 12 lb. His eyes were bloodshot, and he had varicose veins. His pulse was 50–60, and regular. He had mitral regurgitation, and the electrocardiogram showed an inverted T wave on lead III., suggesting myocardial change. He drank a bottle of champagne a day, and smoked 10–12 cigarettes and 4–5 cigars. With reduction diet, beginning at 1500 calories and falling to 700 calories a day, omission of tobacco and alcohol, massage, electric light baths, and cautiously increased exercise, all symptoms disappeared, and he became rejuvenated in a month. The inverted T wave had become normal. His circumstances were easy, and he was advised to give a longer time to treatment, but felt it his duty to return to his firm. Some months later his doctor let me know that he had returned to his old manner of life, though never a drunkard, and was increasing in weight. He stated his intention of giving himself two or three months' treatment and holiday in a short time. A few weeks later he did his day's work in town, motored to the south coast to dine, motored back late at night, and was found dead in bed the next morning. In this case excess of tobacco and alcohol played a part, as well as over-eating and want of exercise.

The second example is that of a man of 60 (No. 2197) who sought admission for breathlessness, giddiness, and headaches. Six months earlier the giddiness had been more than usual after exercise, and some paresis of the right side of the face and tongue had come on and remained. He was florid, 5 ft. 7 in. in height, and 11 st. 12½ lb. in weight. There was flattening of the right side of the face, but no loss of power in the limbs. He had some congestion at the bases of the lungs, and his radial artery was thick. His blood pressure was 240/160, his hæmoglobin 104 per cent., and he had 5,400,000 red cells. Central vision was gone in the left eye, and there was recent hæmorrhage in the fundus. The patient took a little alcohol and one mild cigar a day. His urine had a trace of albumin, and a few granular casts. Kidney efficiency tests gave normal figures.

On a diet of 1000 calories, reduced gradually to 800 calories, and appropriate physical treatment, this patient lost a stone in a month and the blood pressure fell to 185 mm. He was given a régime and advised to live carefully and give up shooting, and he followed the advice. It is now five and a half years since his first admission. His progress has been checked at intervals since, and has been consistent. During the last three years he has taken up quiet shooting again with enjoyment and benefit. The blood pressure tends to remain at about 200 mm., but there has been no further hæmorrhage.

Cases with high blood pressure benefit almost invariably by reduction if they are overweight, and in the majority the blood pressure is reduced also.

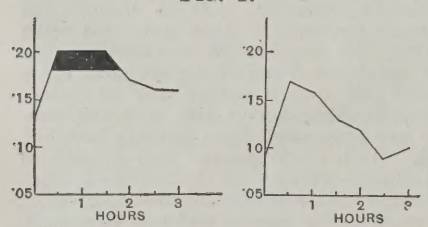
For example, a lady (No. 2316), aged 51, short, weighing 11 st. 11 lb., who had had several alarming hyperpietic attacks with unconsciousness, was admitted with a systolic blood pressure of 240 mm. With gradual and continuous reduction 2 st. 2 lb. was lost, and the blood pressure, which was obstinate at first, began to come down. That is now five and a half years ago. The systolic blood pressure was recently 176, the attacks have ceased, and she is a normal energetic woman.

The reduction of blood pressure, although it occurs in experimental fasting, cannot be ascribed in these patients wholly to the reduction of food value, since hyperpietic patients who are not overweight and are not reduced often yield to a quiet régime with regulated rest and exercise and control of the quality of the diet.

Obesity, Glycosuria, and Diabetes.

It is well known that obesity predisposes to diabetes. R. S. Allison[19] reviewed 121 of our cases of obesity two years ago, and found a not infrequent decrease of carbohydrate tolerance; this appeared to be in the main, though with exceptions, dependent on the length of time that the obesity had existed unchecked. The diabetic tendency would remain undiscovered in many cases if a sugar-tolerance test were not performed.

Fig. 1.



17 st. 2 lb. 13 st. 3 lb.

Showing improvement in sugar tolerance with reduction of weight.

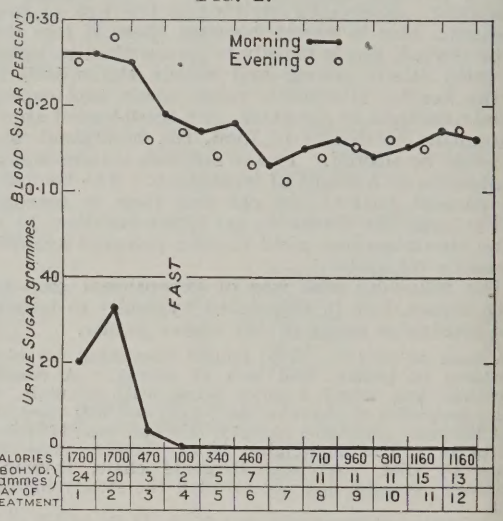
Further, an improvement in tolerance or even a return to normal may take place if weight is reduced. Curves illustrating these points are shown in the paper referred to, and two of them are here reproduced (Fig. 1).

Many mild cases of diabetes in plump people need no other treatment whatever than a reduction in the amount that is eaten. Patients naturally prefer this to a diet which is different in quality to that of others.

A man of 57 (No. 3680) called in his doctor on account of pains in the left shoulder and arm. The heart sounds were poor, and the blood pressure 200/90. The urine was found to contain albumin, 6 per cent. of sugar, and diacetic acid. On inquiry, he admitted thirst and polyuria. Sugar had been found five years before but disappeared, and he had been passed for life assurance two years before. He weighed 12½ st., was short, stout, plethoric, and nervous. He had a hæmoglobin percentage of 105, and 6,200,000 red cells in his blood. He had been taking ordinary food without sugar. The blood-sugar curve was typically diabetic, rising from 0·21 to 0·30 within an hour and falling to 0·21 again in three hours. Many teeth showed periodontitis. The affected teeth were removed, and the patient was given ordinary food, minced at first, to the value of 1500 calories a day, reduced gradually within 14 days to 600 calories.

He was better from the beginning; in about a fortnight the sugar was absent from the urine, and in normal quantity

Fig. 2.



in the blood. After a month he felt and looked well, having lost 10 lb. in weight. He continued on a similar diet at home but not weighing his food, and five months later returned for a check of his state; he was then a stone and a half lighter than when first admitted, with a normal circulation and blood-sugar, and no sugar or albumin in the urine. His self-controlled diet contained about 1100 calories. After a year he contracted pneumonia on a holiday and recovered. The blood pressure and weight then rose again, but with continued observation by his doctor and a six-monthly checking at Ruthin the plethora, diabetes, and nervous state were all greatly improved again, and he has kept on a good plane of health.

In this patient the diabetic state was not only kept under control, but is better fundamentally, as shown by the sugar-tolerance curve taken a year later. The curve now began from a normal level; it still rose too high, but returned nearly to normal in three hours, a very different picture from that of a year before. The red corpuscle count was 5,200,000—i.e., a million less than on admission.

Another case, female, aged 65 (No. 2933), of diabetes with a tendency to obesity, complicated by achylia and a duodenal pouch, has now been under observation at intervals for three and a half years. This lady has had insulin for several periods with a diet of 1800–2000 calories. She always does well, however, the urine becoming sugar-free on an ordinary diet restricted to 1100–1500 calories, without insulin.

Diabetes without Obesity.

The fasting treatment of established diabetes, foreshadowed by Naunyn and von Noorden, and vigorously applied by Guelpa, was put on a scientific basis by F. M. Allen as the results of numerous and painstaking researches upon animals and patients. The introduction of this method, which has been used for about 15 years, marked a great advance. With total or almost total abstinence from food, but with abundant warm fluid, the urine becomes free from sugar, the blood-sugar falls to normal, and acidosis is diminished. We usually give coffee or tea for breakfast and tea with a tablespoonful of skim milk, and at midday and 7 o'clock a bowl of strained soup. It may be noted that tea and coffee are among the substances which inhibit the strong contractions of the fundus of the stomach associated with hunger. A fast of one, two, or more days is well borne as a rule, the patient feeling better and clearer for it. The pancreatic rest has more than a temporary effect in most cases, for when food is added in gradually increasing quantities after the fast it is found that the

power of assimilation has improved.[20] For severe cases the method, though the best we had, was not permanently efficacious, and the discovery of insulin by Banting and Macleod has made the successful treatment of such patients a daily beneficent marvel. There is, however, a large number of mild cases of diabetes in which the dietetic control is best begun by a short complete fast. Time is saved, the sugar is abolished in the urine, and the blood-sugar brought quickly under control. The diet is then gradually raised in the usual way, and often insulin can be avoided. Even though insulin may prove to be needed later, it is wise not to give it in a case of mild diabetes until a fast and graduated diet have been followed by recurrence of sugar in the urine or of high values of the blood-sugar. Fig. 2 is the curve from a case, showing the effect on the sugar in the blood and urine during the fast, which was almost complete. The food value and the amount of carbohydrate given each day are shown below the curve.

Dangers of Severe Hunger Cures.

The fact that starvation, complete or partial, does good to a great many overfed or diseased people has led inevitably to its abuse both within and without our profession. At the end of the first week, hunger having passed in 48 hours, the subject of a complete fast may develop psychic exaltation. He then enters into the happy certainty of the insane, but is manifestly not in a state to interpret physical needs and decide when and what food should be taken. Therein lies a special risk to health. A cult of nature or fasting cures has sprung up again in our day, especially abroad, in which the benefits which some derive has led to the application of the same method to others who do not need or are not fit for it. The fact that a healthy man can fast three weeks or more, feel better, and ultimately be no worse is proof of his endurance and of the wonderful power of the human body to surmount adverse conditions; it is not proof that fasting to such an extent is beneficial to him. The upholders and the subjects of these cures are apt to go beyond and outside what is known to be true in defence of the treatment. A good summary of the point of view is given in a paper by Lochte,[21] of Göttingen.

He relates that a doctor who gave fasting treatment in his own sanatorium was consulted by a man of 52, weighing 10 st. 2½ lb., who complained of headache and of being easily tired. He wished to try the cure, and to put himself into a hygienic way of life before emigrating. On physical examination he appeared to be sound. The régime consisted essentially of living upon lemon squash with a teaspoonful daily of a vitamin preparation. This was followed for six weeks and two days, when the weight had fallen to 7 st. 2 lb. Muscular twitchings then appeared, followed by disorientation, coma, and, in spite of the supply of food, by death eight days later. A legal inquiry was held, and the doctor was arraigned for causing the patient's death through negligence. He made a long defence, which I quote in summary.

The defendant said: Modern medicine was false, especially Voit's teaching. Food does not make folk strong and healthy, and they are not sick and weak without it. This is shown by the fact that there is tiredness and desire for stimulants after a large meal. The modern bowel is unclean. Fasting is concentrated nature-healing. Anyone who fasts a fortnight gains strength every day, and many nervous diseases, also asthma, catarrhs, headaches, and heart, alimentary and skin diseases are not otherwise cured. Phthisis heals rapidly within four weeks. A fasting man sees for the first time, uninfluenced by desires, the world and his fate, and his spiritual life receives new growth. A fast should last three weeks on the average, often longer, and should be followed by a building up on vegetable foods. It should not stop until ketones are absent and hunger returns. Many men have fasted 40 days, following their occupations, and feeling fresher and more able all the time. Acute diseases seldom attack the fasting. "Crises" may occur with bad taste, pains in the back, yawning, weakness, shivering, and vomiting bile. When such symptoms arise, the right course is not to interrupt, but to continue, the fast. Deaths are sometimes unavoidable, but were not more frequent than after surgical operations. He hoped to diminish their number by the study of causes and treatment.

The defendant also stated that he did not order the cure but, finding no contra-indication, gave it at the request of the patient, who was not ill. No biological tests were made, though he had mentioned such. He attributed death to hot baths, which the patient took daily against his advice. The post-mortem has not allayed his suspicion of an undiscoverable vegetable poison.

Other doctors conducting similar cures gave evidence that in a private sanatorium the doctor could not be expected to make tests and metabolism observations, and could not prevent a patient from exceeding the régime.

The prosecution pointed out that many of the statements made were not scientific facts, and that the authorities quoted were not authorities. The defendant's statement as to the absence of contra-indications was weakened by his other statement that he treated all sick people with fasting cures. The initiation of such a fast was a serious affair. No tests and no records of diet were made; indeed there was no means for making metabolism investigations. The clinical thermometer was not used till the day of death. No medical notice was taken of the signs of acidosis and narcosis or remedies used. The doctor was found guilty of negligence in submitting a healthy or nearly healthy man to a dangerous treatment, and not taking the necessary care in the conduct of the cure. He was fined 300 gold marks, or a month's imprisonment, and costs. Naturally, no opinion was given by the court on the value of the method of treatment, but it was stated that such fast cures, if used at all, ought to be conducted in a clinic with efficient daily control of the metabolism.

Lochte concludes that the value of cures of the severity advocated is in the highest degree dubious on account of their effects on both mind and body.

Appendix.

Results of Investigation of Nitrogen Metabolism on Reduction Diet. Analyses by A. J. Leigh, B.Sc.

Period six days. All food was weighed and the nitrogen in the food calculated except for soup, which was determined on four days. Nitrogen in urine was determined daily in duplicate. Fæces were marked off with charcoal and collected over whole period, the average nitrogen content being determined in duplicate.

Date in Jan., 1929.	Diet. Excluding soup. Cals.	C.	P.	F.	Nitrogen (N.). Soup.	Rest of diet.	Total.	Urine N.	Excess N. passed in urine.	Vol. urine.
4	1170	79	70	60	1·34	11·14	12·48	15·01	2·35	1610
5	1140	71	71	60	2·38	11·31	13·69	14·97	1·28	1640
6	1020	64	60	55	1·82	9·52	11·34	14·13	2·79	1690
7	950	60	66	47	(1·58)	10·58	12·16	13·89	1·73	1580
8	1050	59	72	55	(1·58)	11·46	13·04	14·64	1·60	1570
9	1050	60	61	60	(3·56)	9·70	13·26	14·03	0·77	1740
Aver.	1060	65	67	56	2·04	10·62	12·66	14·44	1·78	1640

Fæces.—Average weight per day (wet), 94 g.
Nitrogen 1·46 per cent. = 1·37 g. per day.

Summary.—Nitrogen intake (average per day) .. .. 12·66 g.
Nitrogen output (average per day) urine, 14·44; fæces, 1·37 .. .. 15·81 g.
Excess output over intake 3·15 g. N. per day.
Weight 8 A.M. Jan. 4th, 14 st. 6¼ lb.
,, 8 A.M. ,, 10th, 14 st. 2 lb.
Loss of weight, 4¼ lb. = ¾ lb. per day approx.

Conclusion.—The patient had not reached nitrogenous equilibrium in six days, the excess output in urine and fæces on the sixth day being approx. 2 g. nitrogen, and the average for the period approx. 3 g. nitrogen.

Notes.—The nitrogen figures in the diet are probably correct to the nearest whole number only.

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THE BACTERIOLOGY OF A SERIES OF UTERI REMOVED AT OPERATION.

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A STUDY of the bacterial flora of the interior of the uterus, with special attention to anaerobic organisms, was undertaken with two objects. The first was to ascertain its bearing on puerperal infection. The occurrence of *Bacillus welchii* in puerperal sepsis has been known for the last 30 years, and the work of Lehmann [1] suggests that anaerobic infections are far more common than was previously supposed. In his series of 1664 cases of infection after abortion, 19 per cent. were proved to be caused by the Welch bacillus. Its entry into the uterus is not always easily explained, as there are many cases in the literature where there is no reason to assume that the organism has been introduced by interference per vaginam. It is claimed (Lea and Sidebotham) [2] that various organisms, including hæmolytic streptococci, may exist harmlessly in the puerperal uterus, giving rise to no signs or symptoms. If this is so it is conceivable that an anaerobe such as *B. welchii* might inhabit the non-pregnant and apparently non-infected uterus, leading a quiescent existence unless aroused to activity by some change favourable to its growth in the local condition. The second consideration which led us to seek for anaerobic organisms in utero was the possible relationship of the Welch bacillus to the "red degeneration" of fibroids. The red, œdematous appearance of these tumours is similar to that of muscle infected with the bacteria of gas gangrene; it also calls to mind the change seen in the muscle of the meat-media in which anaerobes are grown in the laboratory. Clinically, such an association has been noted. In a case published by Gabriel and Kingsbury [3] *B. welchii* was demonstrated in a gangrenous fibroid, and also in a second fibroid which they describe as soft, pinkish, and having the histological appearances of red degeneration. We therefore made a routine bacteriological examination of the uterine endometrium and musculature, and especially of uterine fibroids, to discover whether anaerobic organisms could be found therein and, if so, whether their presence was of common occurrence.

Method.

In view of the difficulty of avoiding contamination per vaginam no cultures were taken by way of the cervical canal. Thanks to the coöperation of the honorary surgical staff of the Elizabeth Garrett Anderson Hospital, without whose help the investigation could not have been attempted, we were enabled to take cultures from 47 uteri within a few minutes of removal from the body. No selection of cases was made. The specimens were removed by abdominal hysterectomy performed for fibromyoma or for fibrosis uteri, with three cases of adenomyoma and two of carcinoma fundi. One case of fibroma of the ovary was included. In no case was the operation undertaken for any septic condition.

The material for culture was taken by means of sharp metal cork-borers, previously sterilised and kept ready for use. These were pushed through the uterine wall from the peritoneal surface, previously seared, into the lumen, and the portions of muscle and mucous membrane withdrawn in the borers were transferred to culture tubes with the help of a sterile trocar. Next, a small amount of sterile broth was injected into the uterine cavity by a pipette inserted through the track of the borer, and was withdrawn at once for culture. Finally a boring was made into the centre of any tumour that might be present, the softest being selected in cases of multiple fibroids. Cultures were made into a meat-medium, as we found that any organism grown from the uterus was facultatively anaerobic in so far as it gave good growth in this medium. Aerobic and anaerobic subcultures were subsequently made, and the various organisms isolated. Microscopic sections of uteri and fibroids were examined for organisms and the histological appearances noted.

Results.

Analysis of 47 cases examined shows that 41 cultures made from the endometrium and wall of the fundus uteri gave 17 positive results, and 37 cultures from the interior of uterine tumours gave 13 positive results. The nature, number, and location of the organisms found is shown in the following table:—

Nature of organism.	Isolated from fundus uteri.	Isolated from tumour.
Streptococcus	8	3
B. welchii	1	2
Gram-negative bacillus ..	2	2
Diphtheroid bacillus	3	3
Ditto, with staphylococcus ..	1	3
Staphylococcus..	2	0

Macroscopic examination.—Hyaline degeneration was seen in all our infected tumours, and was marked in those from which *B. welchii* was grown, but other fibroids in which organisms were not found showed this change in no lesser degree. No discoloration was present in the anaerobically infected tumours. Only one "red" fibroid occurred in our series; this grew a non-hæmolytic streptococcus.

Microscopic examination of the tissues from which cultures were taken gave evidence of definite inflammatory reaction in 21 out of the 30 positive cases. These include all those from which streptococci or *B. welchii* were grown. The histological appearance of the tissues from which the Welch bacillus was isolated were similar in our three cases. In one the bacillus was grown from an adenomyoma, the same organism being found in cultures of the endometrium; in another from a fibromyoma. All showed hyaline degeneration of the muscle-fibres, while the connective tissue was œdematous and in places appeared transparent. These almost structureless areas contained some polymorphonuclear leucocytes and plasma cells and many basophilic cells. The basophilia was a striking feature, the cells being apparently nearly twice as numerous as in cases infected with other organisms. It is possible that the transparency of the connective tissue might account for this appearance by bringing into view a greater depth of the section than is usually visible. In the fibromyoma large numbers of Gram-positive bacilli were seen; these were present in the transparent areas in certain parts of the fibroid, but were sought in vain in other parts of the same tumour. This patchy distribution stresses the importance of taking several good-sized pieces of tissue for culture, and shows how it would even then be easy to miss the infecting bacillus in culture as well as in section.

The œdematous connective tissue swarming with bacilli and showing only slight inflammatory reaction gave a picture very like that seen in sections of muscle of a guinea-pig killed by injections of *B. welchii*. We are greatly indebted to Dr. Muriel Robertson for the use of this material for comparison. The histo-

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logical appearances of such infected muscle has been described in detail (McNee and Shaw Dunn,[4] Kettle [5]).

Of the Gram-negative bacilli found three times in culture, two were hæmolytic and resembled an influenza bacillus, forming on boiled-blood-agar small transparent colonies which died unless sub-cultured frequently. They did not, however, give the fermentative reactions of the "hæmolytic influenza bacillus." The third was a coliform bacillus of the *anaerogenes* type.

Of the 12 specimens growing staphylococci and diphtheroid bacilli, alone or together, five showed slight round-celled infiltration in section, the remainder giving no evidence of inflammatory reaction. In view of the possibility of contamination with these two organisms it is doubtful whether they should be regarded as having any pathological significance.

Conversely, where sterile cultures were obtained the microscopic appearance of the tissues was in very fair agreement, 27 of these specimens giving no evidence of inflammatory reaction in section, while 11 others showed varying degrees of inflammatory change. Of these, two were cases of carcinoma of the fundus showing marked polymorphonuclear infiltration with necrosis of the growth, while five were sections of uterine wall showing only slight round-celled infiltration such as would not be incompatible with the normal changes of the menstrual cycle.

In brief, the conformity between cultural and histological findings seemed sufficiently close to warrant the belief that when we grew an organism and found evidence of inflammatory change in the tissue from which the culture was made, we were indeed dealing with an infected uterus or tumour. On such an assessment we found organisms which we believe to be pathogenic in 27 per cent. of the uteri and in 19 per cent. of the fibroids examined.

Discussion of Results.

We have found that organisms are present in the interior of the uterus more frequently than is commonly supposed. Moreover, various organisms, including *B. welchii*, may occur in fibromyomata and in adenomyomata in cases where their presence is unsuspected. It is impossible to diagnose the nature or even the presence of infecting organisms from the naked-eye appearance of such tumours; a fibroid containing anaerobic bacilli showed no features by which it could be distinguished from many others in which no evidence of infection could be discovered. A red coloration of a fibroid is not necessarily associated with the Welch bacillus, a streptococcus having been isolated from the only case in our series. It is interesting to note in this connexion that the production of a pink colour of muscle in meat-medium, which we had supposed to be a specific property of anaerobic bacilli, was given by other organisms grown in the same medium, notably by streptococci. Apparently any organism which grows well in the meat-medium without causing much change in the reaction will produce the conditions necessary for the reduction of the cytochrome of muscle which is responsible for the pink colour. Microscopic examination of the tissues may show changes suggestive of anaerobic infection, and the bacilli may be demonstrated, but they are difficult to detect owing to their tendency to localise in small scattered areas.

These latent infections are therefore impossible to diagnose at operation, and recognition by the pathologist may come too late to be of service to the surgeon, since it is impracticable to make cultures and microscopic sections of every fibroid removed. It is therefore well to remember that signs of toxæmia, with or without fever, following removal of uterine tumours may be caused by the Welch bacillus. The clinical picture in such cases, described by Nürnberger [6] and by Lehmann (loc. cit.), is sufficiently characteristic to justify treatment with antiserum even if the bacillus has not actually been found. It seems probable that gentle handling of these tumours during removal, with avoidance of bruising or injury of tissues, may be of the utmost importance in preventing generalisation of infections.

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THE THERAPEUTIC APPLICATION OF ACETYLCHOLINE.

By MAURICE VILLARET,
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AND
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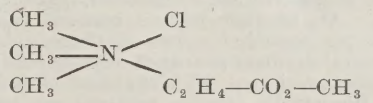
In this paper we propose to summarise as briefly as possible the present position of our research on acetylcholine, believing that it may be of interest to our English colleagues.

Hunt and Taveau in 1906 were the first to test acetylcholine physiologically and to demonstrate its main property—the lowering of arterial pressure. That this action is due essentially to dilatation of the arteries and arterioles has been proved by several workers besides ourselves (Dale and Richards, Krogh, Maurice Villaret, L. Justin-Besançon, and Mme. Schiff-Wertheimer). This action is elective, a subcutaneous injection producing no flushing of the face (no capillary dilatation), while the retinal artery on ophthalmoscopic examination is found to be twice its original volume. Until we introduced acetylcholine into therapeutics two years ago, no one seems to have ventured to administer this product to human beings, as its intravenous administration to animals proved very toxic. A dose of 3/10ths of a milligramme in 2 c.cm. of normal saline injected into a rabbit causes death from sudden collapse of arterial pressure, while its motor exciting action on the isolated uterus of the guinea-pig is 20 times stronger than that of pituitrin or pilocarpine. Compared with choline this acetyl derivative is 100,000 times more active on arterial pressure, but only three times as toxic.

Our primary research was the study of the pharmacological conditions necessary to produce a preparation of acetylcholine suitable for injection into human beings, and our subsequent work during the last two years has been carried out with the anhydrous hydrochloride salt, stabilised with glucose. Acetylcholine hydrochloride has the formula—



This body is very hygroscopic, and for human use certain precautions are necessary. It must be fresh and solutions must be prepared immediately before injection; for this reason we always use the stabilised anhydrous powder preserved in sealed glass ampoules. The purity of the product must be verified by chemical tests and its activity physiologically controlled, for only by having a product of constant composition can errors in dosage be avoided. Our clinical experiments and those of others have shown that acetylcholine can be administered without danger, provided that the injections are given subcutaneously or intramuscularly. Intravenously it is dangerous, orally it seems to have no action. The fact, however, that more than 2000 injections have been given by us personally and nearly 10,000 have been given in the Paris hospitals without one untoward incident affords ample proof that the therapeutic use of acetylcholine is in no way

dangerous, causes neither local nor general reaction, and produces no intolerance, and that its effect is wholly maintained even after repeated administration.

Apart from its main action on arterial pressure, as confirmed by the sphygmomanometer, we should mention its action on the heart, muscles, blood, and humoral equilibrium. On the heart its effect is similar to that obtained by faradic excitation of the pneumogastric, which explains why some physiologists consider this body to be the vagal hormone. This vagal action of acetylcholine has been verified by Henri Fredericq. It excites smooth muscle; in very extreme dilutions it stimulates peristalsis of the isolated intestine. This action is due to excitation of the parasympathetic, of which it is considered as the elective excitant. On striped muscle acetylcholine produces a contraction which is suppressed by atropine but not by curare. It has an anticoagulant action on the blood in vitro. Gautrelet claims that it has an antianaphylactic power. The importance of the effects of acetylcholine, its rôle, opposed on most points to that of adrenalin, and particularly its action on the heart, explain why Gautrelet and other physiologists consider it as a hormone.

Therapeutic Indications and Dosage.

Acetylcholine is given by subcutaneous or intramuscular injections; even large doses (0·2 g.) thus administered are painless and produce neither local nor general reactions. The therapeutic indications are numerous from the fact that its vaso-dilating property is localised on the arteries and arterioles, and further, on account of its effect on the vago-sympathetic equilibrium. Future research will, without doubt, extend its field of usefulness; the principal diseases in which we and others have verified its importance are Raynaud's syndrome, gangrene arising from arteritis, and other troubles of a like nature. Acetylcholine has no influence on the ordinary acro-cyanoses often occurring in young women who, in addition, show a submalleolar erythrocyanosis, a syndrome which one of us has described and proved to accompany a venous hypertension, consequently non-accessible to arterial medication. On the contrary, true Raynaud's syndrome is usually improved by acetylcholine. It is characterised by: (*a*) syncope of the extremities often changing quickly to local asphyxia, the fingers and toes turning purple or even black; (*b*) the presence of pain; (*c*) the occurrence of severe trophic change in the fingers and toes.

Acetylcholine acts by dilating the arterioles of the extremities; it is therefore obvious that when the disease has produced anatomic obliteration of these small vessels, no effect can be expected. The dosage is 0·05 g. subcutaneously the first day and 0·1 g. the following day. If in ten days the results are inadequate, doses of 0·2 g. may be given even twice daily, but in general the single daily dose of 0·1 g. is sufficient. An average course consists of 15 days' treatment per month for two or three months until there is complete disappearance of pain and of trophic and vasomotor signs. If a patient showing active signs of Raynaud's disease receives an injection of acetylcholine, in 10 to 15 minutes the fingers recover their normal colour. This coloration persists for from 12 hours to three days. Pains disappear rapidly, sometimes even after the first injection. The amelioration of trophic changes depends greatly on the extent of the secondary infection, which can very seriously affect the action of acetylcholine.

Arteritis with a Tendency to Stenosis.—When this is pre-senile, senile, or diabetic gangrenous, the effect of acetylcholine is often remarkable. Here the drug acts by dilating the anastomotic arterioles and by diminishing the spasm of the affected vessels, as is proved sometimes by improvement in the oscillometric index. As in Raynaud's syndrome, so in arteritis, there are a large number of failures whenever there is complete stenosis; acetylcholine naturally will not open out an obliterated artery. The dosage we have used is 0·1 g. morning and evening, increased after the first day to 0·2 g. morning and evening. The duration of treatment varies according to the extent of the anatomic lesions. If the case is mild 15 injections per month are sufficient; if the case is more severe the injections must be continued until there is improvement.

The proportion of failures is larger than in Raynaud's disease, for very often the arteries are completely obliterated; but even with arterial obliteration we have obtained the following results: (*a*) Disappearance of the intermittent claudication, generally after five or six injections. (*b*) Ease from pain; in some cases the effect is much superior to that of morphine. (*c*) Disappearance of trophic changes, provided, of course, that they are superficial and that the secondary infection is not advanced. Here also the secondary infection is capable of hindering the wonderful analgesic action of the medicament. (*d*) Increase of the oscillometric index. This is very uncertain, is only seen in the most favourable cases, and predicts improvement. (*e*) Pre- and post-operative treatment. Before every operation it is useful to give the patient a series of injections of acetylcholine as this often limits the extent of the operation, so that, for example, section below the knee may suffice instead of amputation at the thigh. We have seen many examples of this in Paris hospitals and other cases have been reported from abroad. (*f*) In diabetic arteritis acetylcholine plus insulin treatment is superior to insulin treatment alone, and in one case under our observation in which insulin treatment gave no results the pains disappeared immediately after a few injections of acetylcholine and the trophic ulcerations healed quite rapidly. (*g*) In a patient suffering from pre-senile arteritis, after failure of sympathectomy, acetylcholine caused disappearance of the pain from the first injection and very rapid cicatrisation of the trophic lesions.

Troubles and Complications of Arterial Hypertension.—It is well known that some patients with an arterial pressure of 300 mm. of mercury may have no functional troubles, while others with a pressure of 200 mm. have marked symptoms—giddiness, buzzing in the ears, cramps in the calves, dead fingers, defective vision, &c. These troubles seem to largely depend on arterial or arteriolar spasms and their treatment by acetylcholine is worth trial. On the arterial pressure figures themselves prolonged acetylcholine treatment can produce a reduction, especially of the maximum pressure. This, however, is very uncertain and in any case one cannot compare the effect of subcutaneous injections in man with the reduction obtained in animals by intravenous injections. Nevertheless we have a certain number of observations in which the arterial pressure has been favourably influenced. On the other hand, the effect of acetylcholine on functional troubles is very considerable. Cramps of the lower limbs, "dead fingers," sight disturbances, &c., disappear very quickly in most cases. In old people with atheromatous arteries there is danger in injecting too large a dose of acetylcholine; the risk of hæmorrhage in the nerve centres cannot be disregarded.

Indications in Ophthalmology.

Since publishing, in conjunction with Mme. Schiff-Wertheimer, the dilating effect of acetylcholine on the retinal artery several observations confirming our research have been reported on its use in spasms of this artery. The dosage given was from 0·15 to 0·2 g. by intramuscular injection. Bailliart cites a case of spasm of the retinal artery with Raynaud's disease, both troubles being cured by acetylcholine injections. Kalt published a very interesting case of thrombosis of the retinal artery with blindness, which was immediately arrested by acetylcholine; after the first injection the macular vision reappeared with a visual acuteness of 8/100. Important research has just been carried out by P. N. Deschamps and Gallois, and by Courland and Kahane, which shows that the injection of acetylcholine, particularly subconjunctival injection, produces a diminution of the tonus of the ocular globe. The last-named workers further claim

that the subconjunctival injection causes a considerable myosis lasting for a long period.

Tuberculous Sweats and Other Syndromes.

Finally, in the course of clinical research carried out in different directions, we have observed that acetylcholine constitutes an absolutely remarkable treatment for profuse tuberculous sweats. In these, small doses only are required; one to two centigrammes subcutaneously or intramuscularly every day or every other day. Stronger doses may produce absolutely opposite effects. In our experience this treatment is by far the best therapeutic measure.

The effect of acetylcholine on the arteries and arterioles has stimulated experiment in other syndromes, in particular angina pectoris, on which work is now taking place. Again, in different cases we have noticed that the injection of large doses produces an increase of intestinal peristalsis, resulting in the disappearance of habitual constipation. In lead colic, although only a few cases have come under observation, strong doses of acetylcholine (two or three injections of 0·2 g. every ten minutes) seem to give splendid results. Chavany has just published important data regarding the use of acetylcholine in cerebral spasms (transitory hemiplegia). It is possible also, judging from the first results obtained, that the therapeutic and diagnostic action of acetylcholine on the biliary and gastric secretions may not be without interest.

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THE DIAGNOSIS AND TREATMENT OF SUBACUTE CHOLECYSTITIS.*

By WILLIAM BAIN, M.D. Durh., F.R.C.P. Lond., F.R.C.S. Edin.

In discussing the diagnosis and treatment of cholecystitis I shall confine my remarks to the early cases of subacute cholecystitis. The acute variety generally belongs to the domain of the surgeon; it is conceivable that an acute case may subside without surgical interference, but I have not seen such a case. Again, the majority of the chronic, or what I may call the neglected, cases of subacute cholecystitis will probably require surgical aid. These are the borderland cases, which may, or may not, yield to medical treatment.

Anatomy and Physiology.

When I first began to take an interest in this affection I could not obtain a description of the mucous membrane of the human gall-bladder, for the simple reason that it disappeared about 12 hours after death, but, thanks to the surgeons who have removed gall-bladders with practically normal mucous membrane, we are now acquainted with its histology. Bile is partly an excretion, carrying off certain waste products, and partly a digestive secretion, playing an important rôle in the absorption of fats. The bile-acids or their decomposition-products are partly absorbed from the intestines, and are again secreted by the liver. The significance of this reabsorption lies in the fact that the bile salts have a distinctly stimulating effect upon the bile-secreting cells of the liver. They also serve as a menstruum for dissolving cholesterin, which is always present in bile. It is suggested that cholesterin is obtained from the stroma of the red cells destroyed by the liver. The secretion of bile is continuous. The bile pressure averages about 30 mm. of mercury, which is about three times the pressure in the portal vein, thus showing that secreting cells exercise pressure. The capacity of the gall-bladder is small, and the amount of bile secreted in half an hour is quite sufficient to fill it. It has been proved that the amylolytic power of the pancreatic extract is doubled and the fat-splitting action trebled by the addition to it of bile or bile salts. During its stay in the gall-bladder the bile is concentrated by the loss of water and by the addition to it of mucin or nucleo-albumin. Stimulation of the spinal cord or splanchnic nerves diminishes the secretion of bile by constricting the abdominal vessels, but section of the splanchnic nerves may cause an increased flow. When bile is taken by the mouth or injected into the circulation it causes an undoubted increase in the secretion. It is probable that the bile salts have a specific action upon the liver cells. Weinberg states that peptones and proteoses have a marked stimulating effect upon the secreting cells of the liver and so has secretin. It is surmised that each gush of chyme into the duodenum causes, by reflex action, a contraction of the gall-bladder and a relaxation of Oddi's sphincter. The substances responsible for this stimulation are the fats. The contraction of the gall-bladder is not sharp and uniform, but slow and gradually increasing in intensity.

For the size of the organ the blood-supply is generous, and the gall-bladder has a large number of nerve-fibres derived from the vagus and sympathetic. The fibres emerge from the spinal cord in the roots of the sixth thoracic down to the first lumbar, and pass to the cœliac plexus. Slight stimulation of the vagus produces contraction of the organ with relaxation of Oddi's sphincter. Strong stimulation of the vagus causes a more pronounced contraction and a spasm of the sphincter. Stimulation of the sympathetic produces a relaxation of the gall-bladder and a contraction of the sphincter.

Dr. Wilkie's [1] recent experimental results are intensely interesting and illuminating. In his first experiments the entire gall-bladder was cultured, and in most cases no organism was discovered. He then isolated the streptococci from the submucous and outer coats in 42 per cent. of the cases. He suspected and showed that if any bile adhered to the mucous membrane this organism was not recovered. Then a brilliant idea was suggested to him by his brother, Prof. Wilkie—viz., that the cystic lymph gland should be employed for culture. This gland is nearly always enlarged in cholecystitis. In the cases investigated the lymph gland yielded a pure growth of streptococci in 86 per cent. *Bacillus coli* was frequently present in the bile but scarcely ever in the lymph drainage, which is antagonistic to the theory that organisms enter the wall through the lumen of the gall-bladder. When the streptococci were injected into the gall-bladder no change resulted and the bile soon became sterile. When the streptococci were introduced intramurally into the gall-bladder a typical cholecystitis developed within a couple of months. When the streptococci were injected intravenously, the first inoculation merely acted as a sensitiser, but the second and subsequent injections produced cholecystitis. In these experiments the gall-bladder changes corresponded exactly with those in the human gall-bladder. In long-standing experimental cases calculi were formed consisting of cholesterin if the cystic duct remained patent, but if the duct were partially or completely occluded the calculi were composed of cholesterin and bilirubin-calcium. Further, the experiments proved that the organisms reached the gall-bladder by the cystic artery, as all the lymphatics to and from the gall-bladder were severed. Wilkie has confirmed Rosenow's theory that organisms grown from certain lesions can reproduce experimentally

* A paper read at the Harrogate Medical Society in opening discussion on the diagnosis and treatment of cholecystitis.

[1] Wilkie, A. L.: Edin. Med. Jour., April, 1928.

similar lesions in animals. Rosenow was the first to suggest that the streptococci were, as a rule, responsible for the infection of the gall-bladder, but the evidence he produced did not carry conviction, whereas Dr. Wilkie's experiments must appeal to the most sceptical.

When the gall-bladder is inflamed other structures are also involved—for example, the functions of the liver cells and their excretory ducts are depressed and there is generally an alteration in the composition of the bile. In the early cases such evidence is obviously difficult to obtain, unless from a patient killed in a motor accident. However, I am tolerably certain that associated with cholecystitis there is more or less derangement of the liver functions. Wilkie [2] has recently published another series of experiments upon the gall-bladder. After producing cholecystitis experimentally, he killed the rabbits four months later. It was then found that the inflammatory process had extended to, and involved, the liver—"the cells were pale and hazy; inflammatory celled infiltration was present, and there was an increase of fibrous tissue in the interlobular areas." Presumably similar histological changes occur in human subacute cholecystitis.

Symptoms and Diagnosis.

The initial symptoms of cholecystitis are generally referable to the digestive system and are ascribed by the patient to stomachic disturbance; occasionally there are no symptoms, the condition being discovered during a routine examination. Unaccountable intermittent depression is not uncommon and may be the only symptom. Whenever a patient complains of indigestion which has not been relieved by dieting and the usual palliatives, a careful abdominal examination should be made. If the patient were thoroughly examined at the first consultation, mistakes in diagnosis would be reduced to a minimum and operations on the gall-bladder would become uncommon. The most important sign is tenderness on deep pressure over the gall-bladder when the abdominal wall is relaxed. In some cases the right rectus in the hypochondrium contracts on palpation, and occasionally it continues to contract for a week or so after the tenderness disappears. Very exceptionally I found this contraction present without any palpable tenderness. I should be glad if anyone can explain the cause of this physical sign. I regard the tenderness on pressure as pathognomonic, but there are certain pitfalls in eliciting it. Panniculitis over the gall-bladder area requires to be excluded; with ordinary care this is not difficult. In cholecystitis, if the superficial tissues are picked up between the forefinger and thumb over the gall-bladder area, there is scarcely any discomfort, whereas in panniculitis the process is intensely disagreeable. Massage will get rid of the panniculitis, but the manipulations should be confined to the superficial structures, as vigorous massage might aggravate an inflamed gall-bladder. The history of the case is also important in elucidating the diagnosis. Another pitfall is a movable kidney. On examining a neurotic patient without digestive disturbance, I was astonished to find marked tenderness over the gall-bladder. Being apprehensive about the correctness of the diagnosis I sent for the patient next day. There was no gall-bladder tenderness, but the right kidney was about two inches in front of its normal position. The third pitfall is that an affected appendix may mimic the symptoms of cholecystitis. Why Nature should play these pranks upon a too-confiding physician I do not know, unless the object is to stimulate his mental faculties or to diminish his diagnostic conceit.

To differentiate cholecystitis from duodenal ulcer is always difficult and sometimes impossible. The physical signs may be exactly similar, but the history and symptoms are very important. The two affections may coexist. I think it unwise to trust implicitly in an X ray report, but this may be of considerable value in conjunction with the symptoms and physical signs. An increase in the blood-cholesterin occurs in several diseases, but when the increase is associated with definite signs of gall-bladder involvement it helps to clinch the diagnosis. Appendicitis and cholecystitis occasionally occur simultaneously. Legat's reflex may aid in the differential diagnosis. The reflex is almost always absent in early cholecystitis, but when the appendix reflex is present it is a most valuable diagnostic sign. Vincent Lyon [3] attaches great importance to lavage of the duodenum as an aid to diagnosis. I have no experience of the method. In the chronic variety there is usually a leucopenia with a relative lymphocytoses, but I am not aware of any leucocytic changes in the early cases.

Several writers mention other conditions which may be confused with cholecystitis, but it seems to me that with the exception of neurosis, which may imitate a number of affections, no difficulty need be anticipated. In a case of neurosis with some abdominal discomfort we should investigate the case thoroughly and not pay too much attention to the purely subjective sensations. In these cases an X ray examination is imperative, not only for our information, but also to impress the patient, especially if the result is negative.

Treatment.

It is probable that, as a result of Wilkie's experiments, the bacteriologists may now be able to prepare an effective vaccine for cholecystitis. The only difficulty that I can foresee is that in 14 per cent. of the cases the infection may be due to the colon bacillus or to some undiscovered organism, or the condition may be catarrhal, so that a streptococcal vaccine may be harmful. Perhaps a blood test will solve the problem. We must wait and adopt an attitude of animated expectancy. Meanwhile we can have recourse to therapeutic measures, which experience has proved to be beneficial. The first desideratum is to secure an adequate evacuation of the bowels daily. Secondly, the intake of food should be rigorously restricted for at least a fortnight. Thirdly, the prohibition of certain foods, such as sweetbread, brain, liver, kidney, fatty foodstuffs, veal, animal fats, yolk of egg, and green peas is advisable, but much more important is a semi-starvation diet for a short period. It is amazing how quickly the gall-bladder tenderness disappears when the diet is reduced to a satisfying minimum. The recuperative power of the liver after a well-earned rest is striking. Fourthly, improve the digestion, administer cholagogues—the bile salts being the most effective—and prescribe liver packs. If the blood pressure is even moderately high the needle douche should be omitted. Strong sulphur water is not only a cholagogue but also a powerful intestinal disinfectant. For acidity a useful combination is cremor magnesia and liquor taka diastase with carminatives. Sodii glycocholas, grs. 3, and urotropin, grs. 7, can be dispensed in cachet form, a cachet to be taken night and morning, and these drugs are clearly indicated in this affection. Colalin gr. ¾ (cholalic acid), may be substituted for the glycocholate. Exercise, such as riding, golfing, curling, walking, and bowling, tend to improve the digestion and to increase the work of the liver. Chills and fatigue should be avoided and the use of warm baths daily should be encouraged. Patients do not realise how very important the skin is as an organ of excretion.

After a short period of dietetic restriction endeavour to promote the general nutrition of the patient by the means already indicated. In this connexion remember that nitrogenous food increases the amount of bile salts which provoke the liver cells to greater activity. Finally, try, if possible, to ascertain the cause of the infection so as to prevent a relapse. If a septic focus be discovered, the appropriate remedies should be applied.

[2] Wilkie: Brit. Jour. Surg., 1928, xv., 450.

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SOME ASPECTS OF THE SURGERY OF THE SPLEEN.*

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With spleen's dead weight though heavy grown,
In life's rough tide I sunk not down,
But swam 'till Fortune threw a rope,
Buoyant on bladders filled with hope."
(*M. Green, born 1696, died 1737, "The Spleen."*)

Historical Introduction.

A TRIBUTE to Hunter's work on the spleen is only appropriate. Hunter recognised that the organ was not essential to life, described it in over 40 vertebrates, and spoke of accessory spleens. He knew of injury and of enlargement in man. The "General Principles of the Blood" shows how Hunter sought for the solution of problems, many of which beset us to-day. There are nine original spleen specimens of Hunter's in the Hunterian Museum, including rupture, abscess, and cyst in man and normal spleens of various animals.

The case records of Hippocrates contain examples of enlargement of the spleen. In one work of the Hippocratic collection it is said "those persons whose spleen is large have their bodies meagre," which gave rise to Trajan's comparison that the Imperial Treasury was like the spleen, because when that was rich the people were impoverished. Suggestions in Pliny and the Talmud that the spleen was removed in men and in horses to increase their speed find confirmation in the recent work of Macht and Finesilver [1] who, experimenting on rats trained to walk a tight-rope, found that their speed was increased after splenectomy. It is now 300 years since Malpighi successfully tied the splenic vessels in a dog. The operation of splenectomy in man and animals has been performed by many workers in the past and is now being performed for various blood disorders.

Diseases Illustrated.

This oration is based on 17 cases. They include splenic anæmia, Banti's disease, syphilis, leukæmia, purpura, hydatid, unidentified splenomegaly.

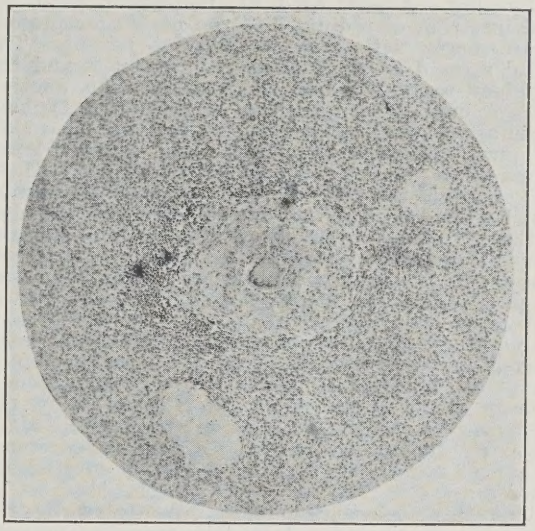
Splenic Anæmia.—In some of my cases who had had hæmatemesis operations had been performed elsewhere under a mistaken diagnosis before they reached my hands. In one case of splenic anæmia, hæmatemesis preceded a demonstrable splenic enlargement, and an early correct diagnosis was made from the blood examination before operation. Recovery, lasting two years, was compatible with liver enlargement, and the blood in the cases described was restored to normal.

[Prof. Sheen then gave the usual signs and symptoms of splenic anæmia, and in reference to its unknown origin emphasised the necessity of investigating the microbiology and toxicity of removed spleens.]

Cases unoperated on terminate usually by passing into Banti's disease, sometimes by progressive asthenia. The term Banti's disease is reserved for the late stage of splenic anæmia with cirrhosis of liver and ascites. While splenectomy does not give such favourable results as in the early disease, recovery often takes place after it, and the liver is restored to normal size. A woman, aged 56, had profound anæmia and profuse uterine hæmorrhages, which ceased with calcium and horse serum. She had all the clinical and blood signs of Banti's disease and her abdomen was tapped twice. Rest and a diet containing liver and orange-juice much improved her condition, and splenectomy was performed with recovery. The spleen was tuberculous, and there was tuberculosis of the liver and other viscera. All cases in this group should have liver function tests performed and the Wassermann reaction taken.

Every case of hæmatemesis or of bleeding from uterus, bowel, or kidney without obvious cause should have a blood examination. The platelet count is important. Rosenthal [2] divides cases into two groups, the *thrombocytopenic*, where the platelets are very low before splenectomy and rise to about normal afterwards; hæmorrhages are marked, and the *thrombocythæmic*, where the platelets are about normal before splenectomy and rise to a very high level afterwards; hæmorrhages are less marked or absent. Splenectomy is satisfactory in the first group but not in the second, in which one of Rosenthal's cases died from mesenteric thrombosis and the others were unimproved and suffered from thromboses in various sites. W. Howel Evans [3] supported Rosenthal's conclusions and recorded a thrombocythæmic case which died from mesenteric thrombosis. He pointed out that coagulation time and clot retraction should be observed; the former is lessened and the latter much more marked after splenectomy.

FIG. 1.



Tubercle of the spleen (× 60).

Fortunately for surgery, the thrombocytopenic appear to be more numerous than the thrombocythæmic class; in my view the latter may be brought into a more favourable condition for splenectomy by the use of an anti-platelet screen or by transfusing the blood of a-cytopenic into a-cythæmic patient. In two of my cases the platelet count has gone up markedly after splenectomy.

According to E. H. Kettle [4] splenic anæmia has no pathological status as a disease. All that can be said at present is that toxic spleens from many causes show evidences of chronic splenitis varying as disease progresses.

Syphilis.—In a case of inherited syphilis after other treatment had failed, the enlarged spleen was removed successfully, and the Wassermann reaction positive at operation was negative three years later, and the patient well. Secondary anæmia and leucopenia were present as in splenic anæmia, and disappeared after splenectomy. Spirochætes were harboured in the spleen.

Myelogenous Leukæmia.—One advanced case, not operated on, had intractable bleeding from a small transfusion wound. In another case the spleen was successfully removed and the patient gained 2 st. in weight, but the characteristic blood condition did not alter and the patient died elsewhere 18 months after splenectomy from cholecystitis and peritonitis.

* Abstract of the Hunterian Oration delivered at the Mansion House, London, on March 4th, 1929. The oration was illustrated by a large number of specimens, photographs, microphotographs, drawings, microscopic and lantern slides.

The important feature in the blood is not enormous increase of white cells, for the case might be aleukæmic leukæmia, but the presence of immature white and red cells. The blood-platelets are usually increased while they are diminished in lymphatic leukæmia.[5] Hæmorrhages in the earlier stages of the disease do not prohibit operation. The spleen often shows infarcts and is largely transformed into myelocytic tissue. Splenectomy at one time was almost universally fatal, but experience at the Mayo Clinic [6] has shown that it can be done with a less than 5 per cent. mortality. But the abnormal blood remains and the eventual outlook is bad.

Purpura.—A girl, aged 21, underwent curettage and insertion of radium into the uterus for profuse metrorrhagia with anæmia, without benefit. The blood showed great diminution of platelets and the capillary resistance test was positive. In another case, a boy of 16, admitted as perforated typhoid ulcer after bowel hæmorrhage, there were also skin purpura, epistaxis, hæmaturia, and swollen knee-joints; the platelet count was high, 680,000. These two cases illustrate that purpura, like splenic anæmia, can be divided into thrombocytopenic and thrombocythæmic classes. Dr. G. A. Sutherland and Dr. Bruce Williamson [7] have given details of the former class. It is purpura hæmorrhagica or Werlhof's disease, and many acute cases tend to natural recovery. The more chronic cases with recurrent hæmorrhages require splenectomy. Epistaxis, small purpuric spots, easy bruising are other common features. The platelet count is low; the spleen is usually slightly enlarged. After splenectomy the anæmia goes and the platelets rise to normal. Mayo says [8]: "In this dyscrasia the effect of splenectomy is almost miraculous and the mortality surprisingly low."

The thrombocythæmic class, illustrated by the second case, includes Henoch's purpura, purpura rheumatica (Schonlein), and anaphylactoid purpura—i.e., where there is urticaria and angioneurotic œdema. The spleen is not usually enlarged, purpuric spots are big. The blood may show secondary anæmia, platelets are either normal or increased. Bleeding time, coagulation time, and clot retraction are normal. Splenectomy is not indicated here with our present knowledge; as with splenic anæmia there is fear of a large rise in the platelet count after operation leading to thrombosis, which may cause death. Mr. C. A. R. Nitch kindly presented me with an enlarged spleen removed by him. The clinical diagnosis was purpura. Before operation there was leucopenia, a low platelet count, and high relative lymphocytosis. These improved after operation. There were no young cells in the blood. Expert histological opinions favoured myelogenous leukæmia, but in that the platelets are increased and there is not a high relative lymphocytosis. The clinical condition did not fit leukæmia of any kind and there was a good recovery. If leukæmia, it was leucopenic leukæmia. Splenic anæmia and aplastic anæmia had also to be considered and the case illustrated well the difficulties of fitting together the diagnostic puzzle.

I would emphasise the necessity of blood examination in cases of unexplained uterine bleeding, and would suggest that miscarriages in healthy young women might be due to blood abnormalities.

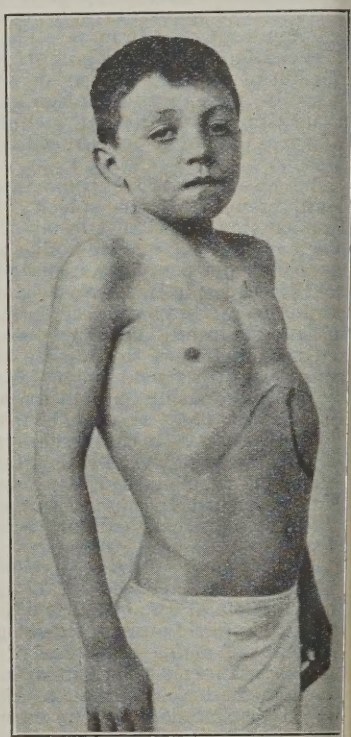
In the secondary purpura of splenic anæmia and of leukæmia, the splenic enlargement is great.

Hydatid.—A cyst in a boy of 12 presented a prominent swelling, and was treated by marsupialisation as the spleen was too adherent for removal. Unexpected death took place from acute double broncho-pneumonia.

Splenomegaly.—In five cases this was the only diagnosis. One with pyrexia which died at home unoperated on was possibly a septic splenomegaly and somewhat resembled kala-azar. [Prof. Sheen spoke of the importance of seeking for protozoal organisms and quoted Fantham and Porter [9] as saying of herpetomoniasis, "disease is in the making to-day"]. Another case died of broncho-pneumonia; the record was incomplete. It might have been leukæmia. Another case presented some of the clinical features of Gaucher's disease; the patient recovered after splenectomy. The spleen was merely a sponge of blood and showed no definite histological picture. The two final cases were in good health, with normal bloods, a negative Wassermann reaction, and no distinctive pathology in the enlarged spleen. They made good recoveries after operation and remain well. Such cases, as knowledge advances, will find their places in a revised nomenclature.

The Blood Examination.—[Prof. Sheen showed tables of blood counts in 15 of the cases. Disappearance of leucopenia and rising platelets were evident in splenic anæmia. The immature cells remained after operation in leukæmia. The method of platelet counting was described. Fallacies resulting from a platelet rise after any major operation had to be guarded against.]

FIG. 2.



Hydatid disease of the spleen showing surface marking of enlargement.

Pathology.—The preoperative diagnosis may have to be revised in the light of the histological findings. The morbid histology is very difficult.

Radiography of the Spleen.—The enlarged spleen can usually be seen in a real "snap-shot." Five radiograms were shown. The syphilitic spleen gives a very distinct shadow. The spleen in a splenic anæmic case distorts the stomach filled with a barium meal. The tuberculous spleen and one splenomegaly give shadows. The shadow of the hydatid cyst shows the line of the cyst wall very clearly.

Radium.—Preoperative radium application to the spleen produces its shrinkage in splenic anæmia and leukæmia, and the blood and general condition improve. The great reduction in the mortality of splenectomy for leukæmia in the Mayo Clinic has followed the use of radium sometimes combined with X rays.[10] I have used radon in a many-curved glass tube kindly supplied by Prof. S. Russ, of the Middlesex Hospital Radon Centre. Marked shrinkage has taken place in two cases, while in two others the spleen did not alter, probably because a large number of applications were required.

Transfusion.—I believe this to be of great value in relation to splenectomy where anæmia is present, and I have carried it out in eight cases—often multiple transfusions before operation, and in four cases a single transfusion after operation. The number of red corpuscles went up greatly.

Preoperative Measures.—Radium and transfusion have already been dealt with. Prof. A. M. Kennedy has shown the great improvement which follows the administration of liver and orange-juice in the diet

Calcium and 5 per cent. lactose are given for a few days before operation. Rowntree and his co-workers at the Mayo Clinic have shown the value of novasurol (or merbaphen).[11] The drug prevents or removes ascites. Liver function is tested before and after its use by noting the rate of disappearance of phenol-tetra-chlorphthalein injected into the blood. In a series of patients with Banti's disease in the Mayo Clinic retention graded 4 was reduced to retention graded 2 when splenectomy was performed with recovery.[12]

The Operation of Splenectomy.—In operating I stand on the right side of the patient and make a left paramedian incision. Adhesions are separated, the spleen delivered, and its bed packed. The gastro-splenic veins are first divided and the main pedicle treated by double clamping and silk ligatures. The operation is often difficult. In one case the stomach was torn, in one the tail of the pancreas injured, and in one clamps had to be left on for 48 hours; all these three recovered and wounds healed without incident. Ten splenectomies were done (excluding Mr. Nitch's case), three for splenic anæmia, two for Banti's disease, one for syphilis, one for leukæmia, and three for unidentified splenomegaly. One of the cases of Banti's disease died. Liver diathermy (Crile[13]) was used in the leukæmia case, to keep the portal blood warm, with apparent benefit. At operation the condition of the liver should be noted.

Summary.

1. Splenectomy is indicated in splenic anæmia (including Banti's disease) and in purpura. Each of these diseases is divided into a thrombocytopenic and a thrombocythæmic class. In our present state of knowledge operation should be reserved for the former class.

2. Splenectomy is of value in selected cases of myelogenous leukæmia, but does not lead to a permanent recovery.

3. After splenectomy for splenomegaly in a case of inherited syphilis the Wassermann reaction was negative three years later.

4. Cases which at present can only be classified as splenomegaly do well after splenectomy.

5. Attention is particularly directed to the necessity of a blood examination in cases of unexplained hæmorrhage from stomach or uterus.

6. All blood examinations when splenectomy is contemplated should include an enumeration of the blood-platelets.

7. The morbid histology of the removed spleen is often difficult to interpret. Preoperative diagnosis may have to be revised in the light of the histological findings.

8. Splenic anæmia (with Banti's disease) may only be a symptom-complex. A case, clinically Banti's disease, proved to be tubercle of the spleen and other viscera.

9. Clinical appearances like Gaucher's disease may not be confirmed on examination of the removed spleen.

10. An X ray photograph will often show an enlarged spleen and such photograph may aid in diagnosis. This is illustrated by a case of hydatid of spleen.

11. Radon applications will produce shrinkage of the spleen.

12. Transfusion is of value as an adjunct to operation.

13. Liver diathermy was used at one splenectomy with apparent benefit.

14. A median incision is recommended for splenectomy with the operator standing on the right side of the patient.

I would like to express thanks to Prof. E. H. Kettle, Prof. J. H. Dible, and Prof. A. M. Kennedy for help to Dr. J. B. Duguid and Dr. J. Mills for valuable help, and to Dr. Owen Ll. Rhys for the X ray photographs.

(*References at foot of next column.*)

Clinical and Laboratory Notes.

A NOTE ON CAROTIN AND VITAMIN A.

By Thomas Moore, D.Sc.

(*From the Medical Research Council's Nutritional Laboratory, Cambridge.*)

In 1920 Rosenheim and Drummond published in The Lancet [1] an important communication in which the possible relationship of vitamin A to the carotinoid pigments was discussed. While pointing out that the vitamin could not be identified with any familiar carotinoid they suggested that some unknown pigment might be involved, or that the vitamin might be formed from a carotinoid by the action of light. Although considerable evidence existed to show an association between carotin and the vitamin in their natural sources, the work of Drummond and Coward [2] and of Stephenson [3] showed that crystalline carotin, if carefully purified, was ineffective when supplied to rats as the sole source of fat-soluble vitamins. Interest in the problem was subsequently reawakened by a reference by Drummond, Channon, and Coward [4] to the pigmented nature of cod-liver oil concentrates, but eventually the identification of ergosterol as pro-vitamin D by Rosenheim and Webster [5] gave rise to the speculation that this sterol, rather than a carotinoid, might also be the parent of vitamin A.[6]

In a recent paper by Euler, Euler, and Hellstrom,[7] however, fresh evidence as to the vitamin A activity of the carotinoids is made available. It is pointed out that the earlier work on this subject took place before the separate existence of A- and D-vitamins was realised. Since both these vitamins are now considered necessary for sustaining normal growth it seemed possible that the apparent inactivity of carotin in earlier work might well have been due to the absence from the test diets of adequate supplies of vitamin D. Upon testing crystalline carotin as a source of vitamin A in conjunction with a basal diet adequate in vitamin D, the Swedish workers have in fact observed resumption in the growth of rats on dosages as low as 0·005 mg. per rat per day.

Apart from such direct biological evidence considerable chemical similarities between the carotinoids and the vitamin can be traced. Both the pigments and vitamin resist saponification and are destroyed by oxidation or exposure to ultra-violet irradiation. On treatment with the antimony trichloride reagent, moreover, somewhat similar blue colorations are produced. Euler and his co-workers, realising the importance of this side of the problem, have made these colorations the subject of a detailed spectroscopic examination.

Preliminary experiments upon two samples of carotin, kindly supplied to me by Dr. von Euler and by Dr. R. A. Morton, of Liverpool University, have

Prof. A. W. Sheen: References.

(*Continued from previous column.*)

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afforded support to the claim that this substance may prove active as a source of vitamin A, being effective in sustaining good growth in rats at the minute dosage of 0·01 mg. daily. Although further experiments will be necessary before a definite decision is reached upon the activity or otherwise of chemically pure carotin, it would certainly seem that samples which appear to exhibit all the criteria of purity may exert intense vitamin action. The question next arises as to how this activity may best be interpreted in the light of our available chemical knowledge on vitamin A.

Takahashi,[8] in describing the preparation from cod-liver oil of a concentrate ("biosterin") claimed to consist of pure vitamin A, pointed out some important physical differences by which "biosterin" could be distinguished from the known carotinoids. The former (a viscid oily material considered by Drummond [4] to be highly impure), was characterised by no selective adsorption in the visible region, but displayed a marked band at 320 $\mu\mu$ in the ultra-violet (recently independently confirmed by Morton and Heilbron)[9]; the carotinoids (in general crystalline substances with metallic lustre and high melting-point), on the other hand, were characterised by selective adsorption in the visible and by the absence of marked bands in the ultra-violet. The similarities and differences between "biosterin" and carotin may be summarised thus:—

—	Minimal physiological dose (rat).	Blue coloration with $SbCl_3$.	Selective adsorption—	
			At 320$\mu\mu$ in U.-V.	In visible.
"Biosterin".	0·005 mg. (Takahashi)	Positive	Present	Absent
Carotin ..	0·005 mg. (Euler, Euler Hellstrom)	,,	Absent	Present

Physical properties, therefore, preclude the identity of the classical vitamin A with carotin. Assuming, as the above data would suggest, that the activities of crystalline carotin and of the most potent cod-liver oil concentrates available are of about the same degree, it is obvious that the activity of the concentrates cannot be explained on the basis of such small traces of carotin as may be supposed to be present in them, and conversely that the activity of carotin cannot be explained by the presence of "biosterin" as impurity.

Two explanations may be advanced to reconcile the common activity of sources so different in their physical properties. (1) Both carotin and the classical "vitamin A" may independently possess the same physiological action, or (2) physiological action may be due to an active impurity present in each in amounts so minute as not to affect the physical properties of the materials in bulk.

The first alternative becomes feasible if it be assumed, as Steenbock [10] once suggested, that the classical vitamin A may represent the leuco form of a carotinoid pigment, or if vitamin A activity be determined by some special grouping rather than by an integral molecule, as suggested by Karrer, Euler, and Euler.[11] From a consideration of the extremely small minimal effective dosage of vitamin D, however (less than 0·0001 mg. being adequate in the case of the rat), the second alternative cannot be neglected, since if vitamin A were effective in equally small amounts only about 1 per cent. of impurity in a sample of crystalline carotin would be sufficient to account for its physiological activity. This alternative, however, would entail the non-specificity of the adsorption band at 320 $\mu\mu$, which has recently been shown by Morton and Heilbron [9] to stand in extremely close agreement to vitamin A throughout a wide range of its natural sources, since in carotin this band is absent.

In any case the remarkably high activity of the specimens of carotin cannot fail to be of interest, if only for the reason that they would seem to make the vitamin available in a form comparable in activity with the most active cod-liver oil concentrates that can be prepared. If such high concentration in vitamin A is combined, as would seem probable, with almost complete freedom from vitamin D carotin preparations may prove of scientific value in the administration of vitamin A without the simultaneous admission of the antirachitic factor.

The experiments are being continued.

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A CASE OF
TRAUMATIC ANEURYSM OF THE INTERNAL ILIAC ARTERY.

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TRAUMATIC aneurysm of the internal iliac artery is undoubtedly rare. Still rarer is such a case as the following in which it appears to have followed an operation six years before for relief of an ischio-rectal abscess followed by prolonged plugging.

A man of 45 was brought to me by Dr. D. V. Murphy in January of this year. He was thin and neurasthenic and had complained for about six months of pruritus ani and of passage of mucus and thread-worms. For three months he had had a very slight aching pain in the left iliac fossa and left groin, which he admitted was so insignificant as hardly to inconvenience him. Dr. Murphy had examined his rectum soon after this and discovered a pulsating swelling. About October the patient went to a London hospital and was examined manually and by X rays. As the result very largely of the radiographic examination he was told that he had an inoperable sarcoma of the pelvic bones and that nothing could be done for him. Being at the best of times extremely neurasthenic, this made him miserable and depressed. For two months he did nothing, during which time, instead of getting worse, he appeared to get a trifle better and to put on a little weight.

When seen in January he was thin but did not look particularly ill, while he complained of nothing except the slightest abdominal discomfort. On examining his abdomen nothing could be felt, except that there was a vague sense of ill-defined pulsation deep in the left iliac fossa. On examining the rectum, however, a large, soft, pulsating swelling was felt bulging into the left side of the bowel. The pulsation was expansile, and so marked was it that the examining finger could be seen and felt to be pushed up and down at the anus.

It was thought impossible that such profuse pulsation could be due to anything except an aneurysm. Auscultation of the lower abdomen revealed a loud systolic bruit, the Wassermann reaction was negative, and a radiogram taken by Dr. Geoffrey Fildes showed a series of ill-defined, elongated, winding shadows in the pelvis and no signs of bone disease. These were thought to be due to areas of calcification. The patient then admitted that six years before he had had an ischio-rectal abscess on the left side operated on. He knew very little about the operation, except that it took a long time to heal, and both his doctor and nurse had told him that the plugging went in a very long way, at least six inches.

As the aneurysm appeared to be in danger of bursting into the rectum he was strongly urged to have it operated on as soon as possible. It was obvious that nothing could be done from below, and the abdomen was therefore opened by a left paramedian incision. It was then seen that the whole of the pelvis was occupied by a large aneurysm of saccular form, and springing from the side of the left internal iliac artery, which was pushed upwards and forwards by the sac. The internal iliac artery was enormously dilated, being over an inch in diameter right up to its origin from the common iliac. Compression of the internal iliac vessel completely stopped all pulsation in the sac. It was therefore decided to tie this vessel in continuity, and this was done as near the sac as possible without very much difficulty. The patient made an uninterrupted recovery, and three weeks after the operation the swelling in the rectum could be felt to be about half its original size, quite hard and firm, and devoid of any pulsation.

The origin of this aneurysm is, of course, a matter of speculation, but as the patient's Wassermann reaction was negative, and the aneurysm was saccular in form, while there was a perfectly clear history of a deep perineal operation on the same side followed by extensive plugging, the probability seems very strong that in some way the vessel had been damaged or bruised during this latter procedure.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ORTHOPÆDICS.

A MEETING of this Section was held on March 6th, Mr. NAUGHTON DUNN, the President, in the chair.

Mr. M. SMITH-PETERSEN (Boston) gave a lantern-slide demonstration on

LOW BACK PAIN.

He had tried to look at the problem, he said, in an honest, sincere manner, and invited criticism. He thought the reason why surgeons could not diagnose between lumbo-sacral and sacro-iliac lesions was that they did not analyse the conditions adequately. He showed diagrams illustrating the action of muscles and ligaments in various movements. In a lifting injury, for instance, ligamentous strain might be eliminated. The surgeon must differentiate between ligamentous and muscle strain, for they took very different times to repair, and over-treatment was a common cause of "chronic back pain." If he had confidence in his diagnosis the surgeon could stop immobilisation and start exercise at the right moment. Strain in hyperflexion would sprain muscles first, then ligaments, and would finally cause compression fracture. In lifting, the hamstrings became taut and the ilium was rotated posteriorly, so that the obliquely placed sacro-iliac joints might be involved, the ilium being levered away from the sacrum. The interspinous and articular ligaments could not be involved in any movement that reduced flexion. They were innervated by the spinal nerves, and on this depended the pain located over the peripheral distribution of these nerves. No injury to the lumbo-sacral or lumbar region would cause pain over the distribution of the second sacral nerve. The sacro-iliac joint was practically immobile; the lumbar spine had a good deal of movement. The former was a shock absorber, and the only muscle that protected it at all was the pyriformis. If the hamstrings suddenly became taut, especially if the leg were flexed, there was a tendency to slight displacement of the sacro-iliac joint surfaces, so that prominence was brought against prominence. When the hyaline cartilage was put under pressure in this way traumatic arthritis resulted. The posterior and superior sacro-iliac ligaments were supplied by the first and second sacral nerves, but the innervation of the anterior ligaments was not yet known. On this nerve-supply depended the pain over the lower back and the back of the leg and thigh. It should not be called "sciatica," for only two-fifths of the nerve were involved. The subjective pain corresponded almost exactly with the anatomical distribution of the first and second sacral nerves.

As a man cranked his car he flexed his knee, hip, and trunk and then suddenly tightened the hamstrings, which tended to pull down the ischium and rotate the ilium posteriorly. A woman driving a long, expensive type of car flexed her trunk; then as she pushed the clutch and brake she suddenly tightened the hamstrings. These were two common causes of sacro-iliac strain. Complete relief from sciatic pain due to typical tuberculous infection of the joint had been obtained by operation confined to this joint alone.

The Examination.

The reaction of the patient to each step of the examination must be assessed, and diagnosis must be based on negative as well as positive findings. The examiner must know exactly what he was palpating: kidney, transverse process, lumbar supra- and interspinous ligaments, lumbo-sacral facet, origin of erector spinæ, fourth spinous process, ilio-lumbar ligament, posterior spine, inferior part of sacro-iliac ligaments, superior gluteal nerve, sacro-coccygeal junction, and sciatic nerve-trunk. Tenderness at any of these points would direct the attention to particular sites of possibly injury. Movement should always be tested standing, sitting, and lying. As the patient sat down the hamstrings became relaxed, and when he lay down they relaxed, but gradually became taut as the leg was raised, and leverage was passively transmitted to the pelvic joints. Passive lumbar flexion gave valuable information. *When* pain was caused in examination, and not *how much* pain could be caused, was what gave the examiner the desired information. There was no one pathognomonic sign; diagnosis rested on the history as a whole and the examination as a whole.

X rays were never diagnostic of injury to the sacro-iliac joint; they might confirm a clinical diagnosis only. The X ray appearances varied at different ages, and the surgeon should be familiar with the normal conditions. If one joint looked "older" than all the other joints of the body it would arouse suspicion. The wear and tear of life made the cartilage thinner and hypertrophic changes began to appear. X rays must always be interpreted on the basis of age. The same process of thinning of the cartilage was shown histologically. The changes in the hyaline cartilage in traumatic arthritis were not known, but those of recurring sacro-iliac trauma could be histologically demonstrated, because the cartilage was deliberately removed in treatment. Abnormal calcification, nesting of cartilage cells, and outgrowth of fibrous tissue were found, resembling the "normal" cartilage of much older people.

The Operation of Arthrodesis.

Removal had excellent results and was justified when errors in alignment were diagnosed—for instance, by stereoscopic X rays. Modifications in the operation had been introduced to cause as little trauma as possible. The incision went along the posterior third of the iliac crest and then curved down over the posterior sacro-iliac ligaments. Subperiosteal reflection meant removal of the periosteum in a continuous glistening sheath by a thin osteotome which cut and did not break. Retraction must not be too vigorous; the superior gluteal artery might be torn or the gluteal nerve strained. A "window" was then made in the bone, the cartilage removed, and the plug replaced. The gluteal periosteum and fascia were made to approximate and adhere to the cancellous bone by resecting the iliac crest, and some of the cancellous bone was packed around the "window" in the joint. A series of 100 cases had given complete

success in 88 per cent. and partial success in 8 per cent. In all cases everything possible had been done to relieve the patient before operation. Mr. Smith-Petersen reviewed the four failures and the lessons they taught. One was that the posterior sacral plexus must not be disrespected. Another was that active, progressive, infective arthritis should not be subjected to arthrodesis; the pain was less on the operated side than on the other, but it was not relieved. One of the partial failures showed arthritic changes in the hip-joint after operation, although before treatment the symptoms had been confined to the sacro-iliac joint. The prolonged period of symptoms, with the leg held in flexion, often caused contraction of the gastrocnemius, and exercises should be given to stretch it. There had been one case only of operative infection in the series; this was easily produced if rigid precautions were not taken. Another "partial failure"—a stretched scar with recurrence of symptoms—emphasised the importance of covering up the approach most carefully. The majority of cases got well without operation, and cases for surgical treatment should be selected with caution and care, after all methods of conservative treatment had been consistently tried for many months or even years. One patient had been unable to sit down for meals for 30 years; after operation she could live a normal life as a housewife. Others had had symptoms for 10 or 20 years. Success depended on diagnosis; if diagnosis could not be made for certain it should not be made at all. Practically all the surgical cases had had "sciatica"—first and second sacral pain—and the diagnosis had been certain before operation.

Discussion.

Sir ROBERT JONES related his experience of "backs" in the old days, when treatment had been simple. The first thing had been a little counter-irritation followed by a firm plaster made of pitch and paper. Many patients had responded in five or six weeks; those who did not were regarded as "neurotic," which was almost equivalent to malingering. A "spontaneous" recovery after an injury had suggested the manipulative treatment for obstinate cases. He thought there might be some common factor to all these troubles and that many recoveries might be due to the breaking-down of adhesions. No pain had quite the same intensity as the pain of adhesions. In the early case of spondylolisthesis and tuberculosis there was little pain. Perhaps manipulations failed because they were not thorough enough and fierce enough. He would still try breaking down adhesions before operating. He agreed absolutely that one should not operate unless one was fairly certain of a good result.

Dr. T. STACEY WILSON pointed out that any injury to the spine was bound to be followed by protective muscular contraction, and when the injury was cured the habit of contraction would remain, causing continued pain which could be relieved by rhythmical exercises.

Mr. BLUNDELL BANKART endorsed what Sir Robert Jones had said; these conditions were very common and easy to cure by vigorous manipulation. Lumbo-sacral strain was quite a different condition and hard to cure, as it was difficult to localise manipulations to that joint. The commonest cause of back pain was the functional or neurotic spine; a neurosis was superimposed on the organic lesion in most cases. It had coloured the whole symptomatology, accounted for the wide diversity of manifestations, and had opened the door to all kinds of therapeutic "stunting." It must be taken into account in treatment.

The PRESIDENT said that most cases got better with conservative treatment.

Mr. SMITH-PETERSEN, in reply, said that "conservative methods" included all sorts of exercises and manipulations as well as support by strapping or braces. Everyone must work out his own ideas of supporting belts. If there were evidence of disalignment, manipulation might be tried—first without and then with an anæsthetic. Plaster was not good; it merely caused weakness and strain of the joints above and below. The object of treatment was to return the patient to his normal activity, not to an invalid life in a mechanical support or to a series of recurrences. Sometimes surgeons were apt to call a patient "neurotic" because they did not know enough about him; nevertheless "neurotic backs" did exist. In some cases old-standing cases could, after operation, put aside all the past and live normal lives. If there were pathological changes in the joint, exercises would not cure. Soft elastic tissue allowed displacements to recur and justified operation. In his experience manipulation by experienced osteopathic surgeons did not always cure patients whom operation would relieve.

LONDON ASSOCIATION OF THE MEDICAL WOMEN S FEDERATION.

A MEETING was held at the British Medical Association House on Feb. 26th, Dr. F. HUXLEY, the President, being in the chair. The subject under discussion was

Opportunities for Work for Medical Women Abroad.

Papers were read by Dr. M. E. Johnstone (Canada) and Dr. K. Atkinson (America), and letters on the subject were sent by Dr. Emslie Hutton (Near East) and Dr. M. Hickley (South Africa). Miss L. Martindale and Dr. K. Warren (Uganda) also contributed to the discussion.

Dr. JOHNSTONE spoke especially of the Province of Alberta, where she had been working under the Department of Public Health. Here the opportunities were very good, as there is complete reciprocity in the matter of registrable qualifications, and indeed, at the present moment, the Department of Public Health is advertising for several women district medical officers to go out at once. The work is mainly among the women settlers. The infant and maternal mortality-rate is, at the present, excessively high, owing to the lack of medical facilities. The climate is one of extremes, but is very healthy, and the whole province is in a state of rapid expansion and increasing prosperity. The prospects for Government medical work, or for general gynæcological practice in one of the larger towns are very good at the present time, and will probably improve still further.

Dr. ATKINSON spoke of hospital work in the United States, especially (where her experience was greatest) in Philadelphia and San Francisco. She gave an enlightening account of work among negro and alien patients, and touched on the differences between the British and American hospital systems. She spoke hopefully of the prospects of gaining "interne" posts, and of the value of these, and the possibility of passing to resident appointments from them. Conditions on the whole did not appear to be vastly different from those prevailing in England.

Dr. EMSLIE HUTTON'S message was not encouraging for English women. Over the whole of the Balkan States and Russia there seems to be practically no opening for English women, though for native qualified women there are numerous appointments. A few mission hospital appointments only are open to foreigners, but there is great opposition from officials.

Dr. HICKLEY wrote of South Africa from two distinct points of view—namely, practice in large towns and "up country." The former was hopeful as specialists are rare, and there is always scope for the running of a specialty in connexion with a general practice. She noted, however, that the supply of South African graduates was really sufficient for the needs of the country. Practice in the outlying districts she considered unsuitable for a woman, both on account of the difficulty of transport and the great distances that have to be traversed, and on account of the attitude of the natives.

Mrs. WARREN spoke of her work in Uganda, and implied that there was room for more women, but that up to the present the prospect had not seemed alluring, and practically none had applied. Government work was essential, as private practice does not yet exist, the British population being relatively very small.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held at Sheffield on Feb. 22nd, with Dr. G. W. FITZGERALD, the President (Manchester), in the chair.

Specimens and Cases.

Prof. CARLTON OLDFIELD (Leeds) showed a specimen of some fœtal bones and a uterus removed post mortem. The fœtal bones had caused intestinal obstruction.

Mr. N. L. EDWARDS (Derby) described a case of uterine fistula following Cæsarean section.

The patient, aged 25, had had a Cæsarean section performed for obstructed labour in 1923. The convalescence from this was uneventful, no rise of temperature being recorded. A year later the upper end of the wound broke down, discharging a small quantity of pus. The sinus persisted and after May, 1928, menstrual fluid escaped from it at the menstrual periods which were regular. In September, 1928, the fistulous track was excised entire together with a wedge of the anterior uterine wall in which were embedded two thick silk sutures. Sections of the fistulous track show no evidence of endemetrioma.

Mr. Edwards said that the case illustrated the dangers of unabsorbable sutures in the uterine wall. Other members expressed the opinion that it was the method of suture rather than the material used which mattered in ensuring a well-healed uterine scar.

Prof. CARLTON OLDFIELD recounted two cases of ruptured malignant ovarian cysts. Both cases were seen as acute abdominal emergencies. When the abdomen was opened it was found full of "boiled sago"-like material which was mopped out and the ruptured cyst removed. In each case the abdomen was reopened later and the rest of the generative organs were removed. Both patients had had prophylactic deep X rays since operation. One patient remained well for three and a half years, after which she developed symptoms suggesting a recurrence. The other patient had a recurrence a year later in the transverse colon; 15 months after this one in the jejunum; and now, another 15 months later, had one in the roof of the vagina involving the bladder.

Prof. Oldfield invited discussion on the use of prophylactic deep X rays and on prognosis in malignant ovarian neoplasms. Several members expressed the opinion that deep X rays were not without danger and that the prognosis in these cases was not as bad as was usually thought.

Prof. W. FLETCHER SHAW (Manchester) read notes of a case of uterine diverticulum from a patient aged 34, eight years married and sterile.

She complained of recurrent severe pain in the left iliac fossa at the menstrual period. Examination revealed a mass the size of a small orange in the region of the left appendage. At operation this mass was found to be a cystic left ovary and in the left broad ligament a hard tumour of regular outline about 1½ in. long and 1 in. wide; its upper border was about ½ in. below the round ligament and Fallopian tube and in no way connected with either. It was enucleated from the broad ligament by a considerable amount of blunt dissection and the pole nearest to the uterus actually had to be cut out with scissors. Sections show the tumour to have a thick outer muscular coat and to contain a cavity lined with endometrium but with no retained blood. Its relationship to and entire separation from the round ligament and Fallopian tube preclude it from being considered as a poorly developed uterine horn.

Prof. Fletcher Shaw thought it was a diverticulum budded out from the uterine cavity and then shut off therefrom.

Miss FRANCES IVENS (Liverpool) recorded a case of puerperal gas gangrene infection, a report of which will be published in our columns.

Dr. J. W. A. HUNTER (Manchester) read a note on

Hysterotomy.

He pointed out that the term was used both for an incision into the uterine body through an abdominal incision and for incision of the cervix per vaginam. He suggested that the word "trachelotomy" be used for the latter operation and used it throughout his note. Trachelotomy could be used to facilitate the emptying of the gravid uterus either during pregnancy or at full term, when it was usually done during labour. The note dealt with the use of the operation in labour and the cases of failure of the cervix to dilate were divided into two classes: (*a*) those in which the cervix was normal; and (*b*) those in which the cervix was abnormal either in size or consistency. The mechanism of normal cervical dilatation was described and failure of this was noted as often due to premature rupture of the membranes associated with slight disproportion between fœtal head and maternal pelvis. The note dealt with cases where the cervix was abnormal in length or structure (congenitally), or where it was a part of prolapse and the cervix was hard, thick, and fibrous, but not appreciably elongated. The last type was seen in elderly primigravidæ or in multigravidæ as the result of scar tissue formation. The cases might be complicated by premature rupture of the membranes, slight extension of the head or occipito-posterior positions. The patients were usually left for a considerable time to give the cervix a chance of dilating, but eventually their pulse and temperature began to rise. There was often a history of considerable interference and the child might be dead. Recognised methods of delivery had their difficulties and disadvantages. Trachelotomy allowed of clean incisions into the cervix which could be stitched up carefully immediately afterwards and would allow of delivery by forceps or craniotomy. The method described was of one or two postero-lateral incisions from external to internal os, behind the middle line to avoid the cervical branches of the uterine artery. This length of incision prevented it extending further during delivery. If two incisions were decided upon it was important to mark the site of the second before making the first, as after the first much retraction occurs and orientation is difficult. Accuracy of apposition in suture of the incisions was insisted upon.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

AT a meeting of this Section on Feb. 15th, with Prof. R. J. ROWLETTE, the President, in the chair, a paper on

Protein Shock Therapy

was read by Dr. V. M. SYNGE. His cases were treated, he said, with two intravenous injections of TAB vaccine, the first containing 100 million *B. typhosus* and 50 million each of paratyphoid A and B, whilst the second, given after 5 to 7 days, contained double the number of organisms. About an hour after injection a rigor occurred with a sharp rise in temperature to 103° or 104° F. There was severe headache, pains and sweating, and sometimes vomiting and diarrhœa. Aspirin and perhaps morphia were given to relieve the pains. In cases which did well the temperature was always normal within 24 hours; if the temperature remained up for 48 or 72 hours there was never any improvement as a result of the treatment. Twelve cases (chronic sciatica, chronic arthritis, persistent muscular rheumatism) were treated. In most there was slight temporary benefit, in some no improvement, and in a few cases permanent cure. Two illustrative cases were:—

1. Man, aged 49, right-sided sciatica for nine years; tenderness along course of nerve, wasting of right thigh;

hip-joint normal. Unable to work for nine months. After treatment pain disappeared and he resumed work. When last heard of 14 months after treatment he was still free from pain.

2. Man, aged 25, left-sided sciatica for four months. After first injection, rigor and high temperature, temperature not normal for 48 hours. After second injection, rigor and high temperature, temperature not normal for 72 hours. No improvement from the treatment.

The method, said Dr. Synge, was not new, and was often unsuccessful, but deserved wider use in chronic sciatica and rheumatic conditions where ordinary methods had failed. Obviously it should not be employed for feeble patients or those with cardiac disease.

The PRESIDENT had never understood why vaccines were the form of protein most commonly employed; a vaccine of TAB, besides its protein content, must contain a certain amount of toxin, and so a certain amount of toxæmia must be produced, a complication which would be avoided by using proteins which contained no toxin.

Dr. PRESTON BALL had treated 15 cases according to the method advocated by Yeoman of Harrogate,[1] and had got very good results. The objection was that the immediate reaction was extraordinarily alarming. He had found the treatment successful where there was profuse sweating immediately after the injection, and where the temperature had come down rapidly. He thought that in the unsuccessful case mentioned by Dr. Synge the result might have been good if more injections had been given. The routine treatment was at least five injections.

Dr. E. T. FREEMAN said he had first used the treatment for cases of chronic urticaria and similar conditions. He had at first used peptone, but now used TAB vaccine. This produced a very rapid effect in a very short time.

He mentioned a case of mucous colitis to whom he had given about twenty injections, and the motions had decreased from 20 a day to 3 a day. The patient had remained well for some months, but then returned to hospital and was given an enema which had started the colitis again, and on this occasion the treatment had not been successful, and cæcostomy had been performed.

In cases of bony involvement he had found that protein shock sometimes alleviated pain, but the results were never permanent. He thought the great objection to the method as a routine was that it was utterly impossible to foretell the result. It was an unpleasant treatment, but if it were possible to know the kind of case that would respond, it might be used more often and with greater assurance.

Dr. G. E. NESBITT said the method seemed to be largely on the lines of malarial therapy of parasyphilitic infections, which he did not think would succeed as a permanent mode of treatment. He asked if Dr. Synge had made any observations on the white cell content in his cases.—Dr. W. G. HARVEY preferred the term "non-specific therapy" to "protein shock therapy." Dr. A. B. CLERY mentioned a case in which pain in the legs cleared up after an injection of TAB.

Dr. SYNGE, in reply, said that he preferred TAB vaccine to other forms of protein because it was standardised, and therefore it was easy to decide on the amount which should be given at each injection. He had not investigated the white cell count in his cases. The treatment was unpleasant, and many patients after one injection refused to have a second; but if improvement did not follow the first, or at any rate the second injection, he thought it meant the treatment was not going to be successful. The method was harmless, and the cures amounted to 20 or 25 per cent., which he thought made it worthy of trial.

Dr. R. E. STEEN read a paper on Congenital Pyloric Stenosis, and Dr. J. H. POLLOCK contributed notes on a case of Hysteria.

[1] See THE LANCET, 1926, i., 1246.

Reviews and Notices of Books.

INFANTILE DEFORMITIES.

Diagnosis and Treatment of Deformities in Infancy and Early Childhood. By M. F. FORRESTER-BROWN, M.S., M.D. Lond., Surgeon, Bath, Somerset, and Wilts Central Children's Orthopædic Hospital. With a Foreword by Sir ROBERT JONES, Bart., K.B.E., C.B., F.R.C.S. London: Humphrey Milford, Oxford University Press. 1929. Pp. 199. 14*s.*

As Sir Robert Jones states in his foreword, this book is a lucid exposition of orthopædic principles, written by a surgeon with wide knowledge. It is especially intended for the school doctor, the general practitioner, and all those interested in infant welfare work. The author's work during the war in the treatment and history of nerve injuries is well known, and since the armistice she has made herself equally accomplished in orthopædic work for which she has ample scope at the orthopædic hospital at Combe Down, near Bath, and at the clinics in the counties of which it is the surgical centre. The book differs from other monographs on orthopædic subjects in that it is written in simple language with the single aim of making general practitioners and those in charge of orthopædic clinics thoroughly conversant with the early signs and symptoms of deforming disease, and by the early application of suitable treatment to prevent the obvious and crippling effects of untreated lesions. Every orthopædic surgeon is familiar with cases of, say, congenital dislocation of the hip and knows how long and tedious is their treatment if a good result is to be obtained. Such cases are, however, rarely detected till some time after the child has begun to walk, when changes have occurred which render difficult any anatomical rehabilitation. Yet if the defect of the acetabulum were recognised in the first few months of life cure would in many cases be easy. The specialist has little chance of seeing such patients early, and it is on the general practitioner that the onus of early diagnosis is thrown, more especially since the blame of this developmental defect is apt to be imputed to him in his obstetric capacity.

We commend those parts of the book which deal with defects of posture to our readers, for here the author speaks with authority, having worked under Prof. J. E. Goldthwait, of Boston, and having achieved notable results in her own clinic at Bath. The hints given as to the application of plaster-of-Paris are the valuable outcome of actual experience of difficulties and of the ways of surmounting them. Instruments are sufficiently described and the principles which should guide their prescription clearly stated. The book is well illustrated.

COLLECTED SCIENTIFIC PAPERS OF JOHN JAMES WATERSTON.

Edited with a biography by J. S. HALDANE, M.D., LL.D., F.R.S., Fellow of New College, Oxford. London: Oliver and Boyd. 1928. Pp. 709. 25*s.*

THE prompt recognition of true merit is one of the greatest difficulties in all administrative work. While it is generally believed that this difficulty is less serious in science than in other branches of work, such as literature or art, in which recognition is almost as common post mortem as ante mortem, there are exceptions to this rule. The case of John James Waterston is one of the most striking of these. This scientist carried out much original work of first-class importance, and was, as his biographer says, well ahead of his time in the subjects which he studied. Yet his most important paper—on what is now called the kinetic theory of gases—was refused publication by the Royal Society and lay unrecognised for 46 years until Lord Rayleigh disinterred it in 1891. It is somewhat disquieting to read this paper and to see that what is now regarded as an elementary an

almost obvious theory essential for first-year undergraduate students of physical chemistry was then regarded as too fanciful to publish. Further, Lord Rayleigh's statement that the Royal Society's omission to publish it probably retarded the development of the subject by 10 or 15 years shows the very serious effects of such lack of recognition. Are such instances occurring now? There are many branches of science such as immunology or the study of variation in species in which the need for some really original development seems great. It is interesting to reflect that such developments may have been made already, and refused recognition merely because they were truly original.

Waterston's work was not confined to molecular physics, but included a contribution of more direct interest to medical readers, entitled Thoughts on the Mental Functions. This paper was first published as a book but attracted little attention, and is now reproduced as the first 160 pages of the collected papers. Its value is difficult to appraise owing to the admixture of clear and original ideas that are important, or may be important even though still unrecognised, with a considerable mass that is now discredited, such as phrenology, or elementary pictures of nervous physiology that are now replaced by more detailed knowledge. Waterston himself seems to have recognised that (in 1843) the position of nervous physiology was not sufficiently advanced to make progress in objective psychology at all probable, for after the publication of this book he abandoned the subject entirely and spent his time on physical and chemical subjects, with a few excursions into astronomical calculations. The whole of his published work is here reprinted and Prof. Haldane has rendered a considerable service in thus collecting these papers, not only by ensuring a full if tardy recognition of their author's merit, but also by rendering readily accessible a mass of material that still has value to original workers. The book also includes a memoir of Waterston's life which gives a picture of a brilliant thinker, regarded as a crank by his contemporaries, but none the less making contributions of permanent value to science.

Cœliac Disease and Allied Disorders.

Der Intestinale Infantilismus und Ähnliche Formen der Chronischen Verdauungsstörung. By Dr. G. Fanconi (Zürich). Berlin: S. Karger. 1928. Pp. 202. M.11.

This monograph presents the results of one of the most thorough and detailed investigations which has been undertaken on cœliac disease and disorders associated with it, and it is an important contribution to the literature of the subject. The material consists of over 80 cases seen in Prof. Feer's clinic, and the period of investigation extends from 1911 to 1928. It is recognised that the exact definition of these conditions cannot be drawn with exactitude; the term "Herter's infantilism" is reserved for cases corresponding closely to the recognised type, while "Cœliakie" is applied to the following symptom-complex: large typical stools, prominent flaccid abdomen, hydrolability, retardation of growth, osteopathy, anæmia, and metabolic disturbances such as demineralisation and intermediary acidosis—symptoms which are all referable to dysfunction of the small intestine. The characteristics of each of these symptoms are discussed in turn, with detailed descriptions of the cases and of experimental work carried out by the author and others. A particularly clear and convincing section deals with the exact nature of the osteoporosis and the ways in which it resembles and differs from that of rickets. In estimating the etiology, constitutional inferiority is regarded as the principal factor, while dietetic and environmental influences are also of great importance. Cases in which the latter predominate are classed as "secondary." Dr. Fanconi's treatment, which has given very satisfactory results, originated from an attempt to combat the intermediary acidosis which was revealed by biochemical means. It is for the most part dietetic. The basis of the diet consists of full quantities of fruit and vegetables specially prepared; banana flour is particularly recommended. Sugar and starch are reduced to a minimum; buttermilk and meat are allowed, according to the age. The practical details of this method of feeding are fully set out.

Dr. Fanconi's work is well worth the attention of all who have to treat this obstinate disorder.

Comparative Physiology of Muscular Tissue.

By A. D. Ritchie, M.A. London: Cambridge University Press. 1928. Pp. 111. 7*s.* 6*d.*

The mainspring of physiological research has been inquiry into human mechanisms. Other animals have received attention chiefly in so far as their study threw light on analogous problems in the study of man. More recently there has been a convergence of the work of experimental zoologists and certain physiologists leading to investigations fittingly described as "general physiology," but in few branches of this field has enough material yet accumulated for application of a comparative method to be more than a hope. Owing to the rapid progress in muscle physiology, involving intensive research on frog's muscles, and many researches on the muscles of diverse forms, it has become possible to make comparisons between the variations of function of muscles and the variations of some of their properties in different organisms. Muscles can, for example, be arranged in a series according to their lactic acid content; and it is found that the order in which they are placed indicates also the degree of their activity in normal functioning. If nothing very startling can yet be claimed as the fruit of this method, the halting beginnings of a new science are none the less welcome. Mr. Ritchie is to be congratulated on an admirable presentation of laboriously collected material. The volume is prefaced by a well-balanced and readable account of current views on the physiology of muscle based on the properties of the twitch in frog's muscle, and the thesis is maintained that even such elusive phenomena as "tone" in plain muscle can be interpreted in terms of concepts derived directly from the simple twitch. Conclusions from a series of experiments are the subject matter of this book. The method of presentation will delight the experienced worker, but the absence of detail, such as text-figures, may prevent the beginner from getting quite so vivid a picture of the subject as he might desire. The bibliography is full and carefully selected.

Citizenship and the Survival of Civilisation.

By Sir George Newman, K.C.B., M.D., LL.D. New Haven, Connecticut: Yale University Press; London: Humphrey Milford, Oxford University Press. 1928. Pp. 254. 11*s.* 6*d.*

This volume is based on the Dodge Lectures on Citizenship delivered at Yale University by Sir George Newman last year. The author traces civic growth from the early Greek examples, through the communes of the Middle Ages, and the gilds of later mediaevalism, to the full fledged article of the present day. The ruling end of Greek civilisation, he points out, was the subordination of the individual to the State. The State claimed the entire rights, duties, and life of the citizen, and slavery, infanticide, and the confiscation of women were characteristic of this attitude. The importance of health of body and mind in the individual and in the State is obvious. Unless a person be in good health, the State cannot get the best value for his work, whether he is a boy at school, a labourer on the land, or a craftsman in an industrial centre. This fact holds good in spite of the notable work done by sick men and women, such as Laënnec in our profession and that of R. L. Stevenson and the Bronte sisters, and Mrs. Browning, in literature. Sir George Newman's book has a great deal to say about the present and the future State.

He leads us from Aristotle and Plato to hedonism and utilitarianism, Jeremy Bentham, and the Mills, and so to individualism and collectivism. All his chapters are interesting and show a broad-minded culture; he is at his best in the chapters on disease in history and on the disharmony in the body of man. The chapter on this subject is admirable, and discusses physical disharmonies, neglected physiology, eugenics, maternity, infant mortality, as well as even more abstract conceptions. The chapter on the future expansion of civic mutual aid shows clearly the enormous advance in well-being to the multitude engendered by the modern social services offered by the State. The final chapter is on education in citizenship. Sir George states that another pestilence like the Black Death, or another war like the European War, would probably be the end of Western civilisation; and that preventive medicine and public right are the two—and the only two—answers to physical or social disharmony. The programme here set out may seem to the minds of some at the present time to be Utopian, but those who contrast the health conditions of workers of all ages with those of their predecessors will realise that so much has already been accomplished that the next decade may be even more fruitful.

SPECTROSCOPY OF THE EXTREME ULTRA-VIOLET.

Second edition. By THEODORE LYMAN, Ph.D., Hollis Professor of Natural Philosophy, Emeritus, in Harvard University. London and New York: Longmans, Green and Co. 1928. Pp. 160. 10*s.* 6*d.*

THE second edition of Prof. Lyman's book will be welcomed by all interested in ultra-violet radiation. From the medical point of view this interest is an academic one, for one can hardly hope to make therapeutic use of radiation so easily absorbed by matter that a few millimetres of air can practically quench it. The book gives an extraordinarily interesting account of the methods devised within the last 15 years for the production, analysis, and detection of the extreme ultra-violet rays. These rays are defined by the author as ranging between wave-lengths 2000 and 150 A.U. Beyond, in the sense of shorter wave-lengths, come X rays, which are very easily absorbed, so that no gap occurs in the spectrum such as confronted investigators when the first edition of this book appeared.

This work will prove of the greatest value to those wanting information on the physical properties of extreme ultra-violet radiation.

RADIATION IN CHEMISTRY.

By R. ALAN MORTON, B.Sc., Ph.D. Liverp., F.I.C., Lecturer in Chemistry in the University of Liverpool. London: Baillière, Tindall and Cox. 1928. Pp. 284. 15*s.*

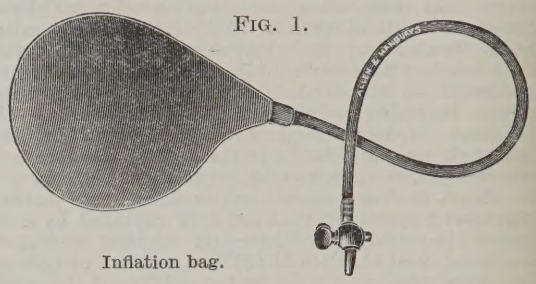
THIS book, which is one of a series designed to give a survey of industrial chemistry, includes within its scope the whole of radiation, ranging from light to X rays. The book is divided into eight sections, each of which is to a large extent self-contained. Mr. Morton has succeeded in producing a book which, though essentially practical, yet shows clearly the theory underlying the processes being described. This is well brought out in the chapters on photographic work, where a description of the processes by which photographic emulsions are prepared is accompanied by a most satisfactory account of the theory of image formation. Section VII., which is devoted to biochemistry and light, travels perhaps unnecessarily far into fields outside the scope of the industrialist. The discussion upon modern light therapy can hardly be of any assistance to the chemist occupied with the irradiation of foodstuffs. On the whole, however, the author has succeeded in presenting information bearing upon chemical processes in an attractive and well-balanced way, and no one will be bored if taken on a few pleasant excursions outside his direct line of work.

New Inventions.

SOME AIDS TO EXCISION OF THE RECTUM.

Inflation Bag.—In carrying out excision of the rectum from the perineum I have found it advantageous to insert a rubber bag into the wound before closing it. The bag (Fig. 1) has a tube and tap attached to it for inflation. The bag is to support the pelvic floor after excision, especially during the first few days, when there is some risk of a hernia

FIG. 1.

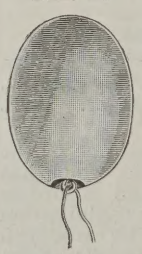


Inflation bag.

in that region if vomiting is severe. It is also useful for the control of hæmorrhage and acts as a drain. The tension can be diminished or increased as required. The bag can be deflated to allow of irrigation of the wound and subsequently inflated. It is usually removed after four or five days.

The Egg.—I have also employed a piece of wood shaped like an egg (Fig. 2), with a small staple at one end to allow of ligature attachment. The egg is pushed into the rectum before the anus is sewn up and tethered to it. During the separation of the anterior wall of the rectum from the male urethra and prostate or from the vagina the egg is pushed forward with the left hand and helps to define the rectal wall. There is often considerable danger of puncturing the rectum during this stage of the operation, and I have found the dummy egg of great assistance.

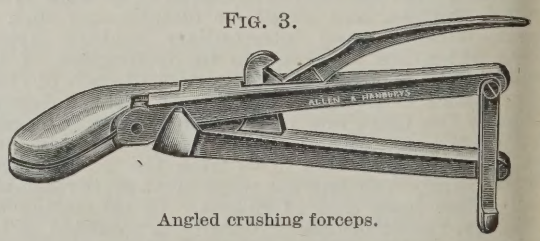
FIG. 2.



The egg.

Angled Crushing Forceps.—The crushing forceps for the bowel which Miles has popularised for the abdomino-perineal operation are often difficult to use satisfactorily in the perineal operation. This is specially so if the growth is a high one and the pelvic colon short when the bowel must be crushed well within the pelvic cavity. To facilitate this stage of the operation I have had a model made (Fig. 3) with the blades set at an angle of 45° with the handle, which allow the bowel to be crushed at right angles to its long axis high up in the pelvis if required.

FIG. 3.



Angled crushing forceps.

These three appliances, which have been made by Messrs. Allen and Hanbury, have been well tested in a considerable number of excisions, and I can recommend their adoption.

C. GORDON-WATSON, K.B.E., C.M.G.

THE LANCET.

LONDON: SATURDAY, MARCH 9, 1929.

A COLLEGE OF OBSTETRICS AND GYNÆCOLOGY.

If ever an undertaking deserved to be described as "an open secret" the scheme for the foundation of a College of Obstetrics and Gynæcology may be thus described. Everyone has known for a considerable period, although so much of the preliminary stages have been conducted with the necessary privacy, that a proposal to form a British College for the advancement of obstetrics and gynæcology, having been under anxious deliberation, has passed into a critical phase; that is to say, the proposals having taken definite shape, the opinion of the existing Royal Colleges was sought and their coöperation requested. The last stage, up to date, was reached when those Colleges manifested a reluctance to support the new movement, although neither of the ancient corporations can be said to have made a more vital objection than that certain of the powers which the new College desired would constitute a trespass upon their provinces. The aims and ideals of the new College were recognised as sound, but the older corporations wanted more proof than they as yet possessed, that it was proposed by the innovators to do anything which they could not do.

The proposal to found the College of Obstetricians and Gynæcologists had for its inspiration many reasons, of which the principal one was the desire to combat maternal mortality, the figures of which are an admitted scandal when the progress of medicine and surgery in every other branch is taken into consideration. Any reform here would imply a better training and a higher standard of examination for medical students in these subjects, with fuller opportunities for learning. Further, the establishment of the College was designed to increase the prestige of this branch of medicine. For it was felt that to secure corporate recognition for a specialty which is both medical and surgical would encourage young practitioners to devote their professional activities to its advancement. Recognising the force of all this we welcome the idea of the College; it will enlist the interest of practitioners in a side of their work and their responsibilities which, in relation to the time spent in its practice, is the most disappointing. There are doubtless disadvantages in the separation of diseases peculiar to women from any other branch of medicine and surgery, but, for good or evil, this distinction is established already, and these diseases have become largely the province of specialists. Further, there may be no need to consider, in the first place, the status of gynæcology, which is only a part of that larger whole—the practice of medicine and surgery; but surely we can all see that the study of obstetrics needs drastic revision. Too many who decide to specialise in diseases peculiar to women regard obstetrics merely as a tedious task which they have to perform until they can afford to refuse to book themselves for any more labours and can spend their days repairing the damage that childbirth still leaves in its train; this may appear cynical, but it is written out of conviction. And a renaissance of the science of obstetrics is overdue. There was a period, not long past, when the mechanism of natural labour was studied intensively, and when great importance was attached to the exact twists and turns induced by the forces acting on the fœtus. Measurements of the bony structure were insisted on, and tiny divagations from the normal, as settled by the interpretation of many figures, were taken into account, even in circumstances where to take such measurements must have been of negligible value. We need not regret the passing into oblivion of some of this lore, but at any rate efforts were being made at that time to reduce maternal and infant mortality by scientific means. When it was found that the mechanism whereby the fœtus reaches the perineum, however well it was understood, was not so easily or safely controlled by outside assistance as had been anticipated, and when it was found that the various diameters of the pelvis gave information which was often belied by trial labour, students and teachers alike became aware that scientific obstetrics was still a dream of the future. The reaction has perhaps been too great, and the modern student is rather sceptical of the value of that part of antenatal care which is not concerned merely with the general health of the pregnant woman. He sees the most confident expert antenatal prophecies belied when he has the opportunity of seeing a case through from pregnancy to labour, and since at the same time he is constantly warned of the danger of interference, he tends to regard midwifery as a subject of which very little is known and in which good fortune more than anything else determines the outcome. That is how we stand.

Meanwhile the maternal mortality figures remain unchanged and the decrease in the infant mortality is perhaps attributable more to our better knowledge of infant welfare than to conditions at or before birth. There is one other factor. Many practitioners say that it is economically impossible for the practitioner to follow out the rules which his teachers impress upon him in the conduct of labours, for he cannot afford the time. And the tragic situation is left to right itself or to get worse. The new College would be expected, if it lived up to its demands for recognition, to take the situation in hand. A Royal Charter is not to be sought, for it could not be obtained while the older Colleges do not approve the undertaking, but the College will be founded under the Companies Act if the Board of Trade is agreeable to the scheme which is being submitted for their approval next week.

HOSPITALS UNDER THE NEW REGIME.

WHEN the Local Government Act of 1929 is added next May to the Statute Book, a new situation will arise fraught with immense possibilities for the health of the people. Voluntary hospitals, in spite of steady development in equipment and number of beds, have admittedly failed to meet completely the needs of curative medicine. The Voluntary Hospitals Commission, before it was disbanded, estimated that at least 10,000 additional beds were required in England and Wales, and although a redoubled rate of increase would have provided these extra beds within about five years, had the means necessary to do so been available, the post-war depression did not allow this to come to pass. Finance has been simplified and facilities improved by coöperative schemes such as the Sussex Provident and the Sheffield Penny-in-the-Pound, and homogeneous areas such as garden cities and garden suburbs have begun to treat with insurance companies with a view to founding hospitals on a mutual basis, but they have not been in time to catch up with the need. Under the new Act the councils of counties throughout the kingdom not only come into possession of all the poor-law hospitals as going concerns, but they also secure the right to maintain hospitals of their own or to subscribe to existing hospitals. This right, as Lord ONSLOW pointed out in his reply to the second reading debate in the House of Lords, has long been possessed by county boroughs, although they have only made use of it in a few cases of special urgency. It would be unfair to prejudge what use the county councils will make of their new powers from the results of these experiments. In taking over the poor-law institutions these councils will have an asset of a very varied character, for, as Dr. H. J. MCCURRICH writes in an essay [1] on the treatment of the sick poor, which appears at an opportune moment, the poor-law medical service is probably the most unevenly administered service in the world. There will be almost unlimited scope in the first and obvious duty of bringing all the transferred institutions up to the present standard of the best of them. The administration of these hospitals and of the new hospitals which will now be founded at the discretion of the councils will be in large measure foreign to their previous experience. While it must not be forgotten that the beds in fever hospitals and sanatoriums outnumber those in voluntary hospitals, and that public health authorities already provide in-patient treatment for a large variety of special purposes, it is, nevertheless, a new era which will be ushered in when the apparatus for both preventive and curative medicine is placed in the hands of the same persons, and no one can doubt that the situation is one which, if rightly guided, will lead to a sounder and better-balanced conception of medical practice.

In the debate to which allusion has been made, Lord DAWSON spoke of the Bill as a great constructive measure which showed vision and far-reaching knowledge. His only concern was for the proper safeguarding of that for which the voluntary hospital has stood in the past. His speech, which may be read on another page, had an epic ring about it. A hospital, he said, is not a building made with hands. It is an organisation; an assemblage of great traditions. The hospital service of this country, as we know it, its efficiency, its flexibility of administration, its public spirit, its warmth of heart, all these have gathered round what is called the voluntary system, which has made British hospitals famous throughout the world. It is these hospitals which have at all times drawn into their service the young man of talent whose ambition it is to get a place in them and who is willing to work for years at a pittance in order to gain experience. In the voluntary hospitals as nowhere else is to be found the atmosphere of knowledge and service. Lord DAWSON'S anxiety is based on the lack of any provision in Part 1 of the Bill to ensure the continuance of this great tradition. He has seen examples of the wrong people staffing hospitals and doing work for which they are neither trained nor suited, and he made a final plea to the Government to introduce a clause making it compulsory for the public assistance committees who will have charge of the new hospital service to coöpt people skilled on the one hand in the administration of hospitals, and on the other some of those whose lives have been spent in doing the work of curative medicine. He commended for the Minister's consideration a plain and straightforward proposal to set up under the chairmanship of the medical officer of health an advisory council of doctors in each district which the council administers. To our way of thinking it is not necessarily the experts themselves who should be coöpted or find places on the public assistance committees, but rather those with proved administrative ability whose work has been closely associated with voluntary hospitals or insurance committees, for it is the lacunæ in the medical benefit under the Insurance Act that will require to be filled in as a first charge on the new scheme. It is, however, essential that the general practitioners of the district who form four-fifths of the medical personnel should have sufficient share in administration to secure their interest and coöperation —an aspect of the subject with which we have recently dealt. Lord ONSLOW, in his reply, offered at once to introduce at the report stage of the Bill a clause designed to impress upon local authorities the desirability of the fullest coöperation with the voluntary hospitals (through committees of the British Hospitals Association) and, when further pressed, agreed to insert words providing that among those to be consulted by the local authorities should be representatives of the medical profession in the district.

[1] The Treatment of the Sick Poor of this Country. Rogers Prize Essay, 1926. By H. J. McCurrich, M.S., M.B., F.R.C.S. Oxford Medical Publications. 1929. Pp. 132. 5s.

THERAPEUTIC STARVATION.

IT has been said with some degree of truth that the starving man is receiving a perfect diet. He is being nourished at the expense of his own reserve stores of all the essential foodstuffs, which, at least during the early stages of his fast, can be called upon in the exact proportions in which they are required, and which, having been already incorporated into his own tissues, must be exactly suited to his needs in the qualitative sense. The term "starvation" covers, however, not only a total deprivation of food, but an insufficiency of any or all of the food elements necessary for nutrition, so that, strictly speaking, no hard-and-fast line can be drawn between the results of undernutrition in the ordinary sense of the word and the symptoms of the food deficiency diseases which are now attracting so much attention. Those engaged in investigating the effects of food deficiencies in animals have, in fact, frequently been misled in their interpretation of results owing to their failure to distinguish symptoms of specific dietetic deficiencies

from those of partial starvation in the ordinary sense of the word. A classical example of such confusion was pointed out recently by S. K. KON and J. C. DRUMMOND,[1] who showed that most of the symptoms commonly attributed to a lack of the vitamin B complex in the pigeon were in reality due to deficient total intake of food. Those who employ restriction of the diet for any therapeutic purpose should always keep before their minds the possibility of unwittingly producing states of specific food deficiency by the vigorous exclusion of particular classes of foodstuffs. In his address to the Medical Society of London, reported in this issue, Dr. EDMUND SPRIGGS laid down the principle that the ideal reducing diet should contain all the usual components of a good mixed diet, restriction being thus practised quantitatively rather than qualitatively. It is not to be denied that the restriction of specific food elements has proved of value in the treatment of individual diseases and we may well hope that with increasing knowledge of the physiological action of particular food elements it will in the future be possible to achieve by this means some measure of control over many morbid processes which at present defy our medical skill.

The commonest indication for a general limitation of food intake is obesity, but as Dr. SPRIGGS wisely observes, in undertaking the treatment of obesity the medical profession should concern itself rather with the associated disabilities impeding the normal functioning of the body as a whole than with the mere æsthetic aspect of the condition. The guiding principle in all reducing cures must be to adjust the energy value of the food ingested so that it is less than the amount of energy spent in the form of heat and muscular work. In the normal individual there appears to be some mechanism which automatically adjusts the expenditure of energy so that within limits considerable excess of food beyond the bare requirements can be taken without leading to any increased storage of fat. In certain types of obesity this mechanism seems to be functioning imperfectly, so that quite severe dietetic restriction has to be practised before any appreciable weight reduction is observed. There are, of course, other cases in which obesity is due purely to excessive indulgence in the good things of this life, and this group can be treated with greater ease and satisfaction, for when their weight has been brought down to the required extent by strict dieting they can maintain it at a constant level while they are taking a normal amount of food. These two groups are not separated by a hard-and-fast line and individual cases are sometimes difficult to classify. It is common knowledge that obesity may appear quite rapidly as the result of some change in the mode of living not obviously related to any alteration in diet or physical exercise. Marriage and childbirth not uncommonly provoke a relatively sudden fat storage in a previously normal individual, or, on the other hand, these same incidents may determine the apparent cure of pre-existing obesity. With our present knowledge it is not possible to predict whether either of the opposing effects will follow a given stimulus, but at least such cases teach us that the metabolic balance-sheet of an individual may at one time register a profit and at another a loss, although there may be no gross voluntary change in the items of expenditure and receipts. In such cases there must be unnoticed variations in the expenditure of energy to account for the gain or loss of weight, provided that the fuel value of the diet remains constant and that the digestive function remains unimpaired; such variations may occur either in the amount of physical work performed or in the amount of heat produced, that is to say, in the basal metabolic rate. In actual practice it is rare to find any definite lowering of the basal rate in cases of obesity. Dr. SPRIGGS points out that the obese person has a relatively small surface area in proportion to his weight, and when this weight, and with it the rotundity of his figure, is reduced, his surface area becomes relatively increased, and his heat loss, which varies with the surface area, is also increased. This principle does not apply to men in all states of nutrition; it has been shown that when a man is wholely or partially starved so that he loses considerable weight and is definitely in a state of undernutrition, his basal metabolism is reduced. It appears that under such circumstances some protective mechanism is called into play which favours the maximum conservation of energy within the body and by this means tends to diminish excessive loss of weight.

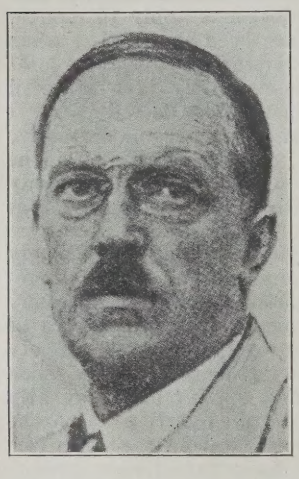
The medical profession is becoming increasingly alive to the virtues of prophylaxis and it may therefore be asked whether partial starvation has any part to play in guarding against the appearance of diseases or the exaggeration of symptoms in already existing morbid processes. It has certainly been established that diabetes and obesity are frequently associated, and there can be no question as to the wisdom of enforcing dietetic restrictions on overweight subjects who may have inherited a predisposition to diabetes. Similarly, those afflicted with circulatory disorders are, as a rule, greatly benefited by a wisely directed course of food restriction if there is any coexisting tendency to obesity. On the other hand, it remains to be proved whether the efficiency of a whole nation could be raised by attempts to regulate the average amount of food consumed by the mass of its people. The experiences of the Great War, and in particular of the Central European States, certainly lend no support to the view that a state of chronic undernutrition is compatible with normal intellectual or physical vigour. The truth would seem to be that the energy value of the average man's diet can be varied within certain limits without producing any predictable effects on his weight or physical fitness, so that the most precise calculations as to the number of calories which a man of a given weight and occupation should consume would by no means necessarily lead to his attainment of any given standard of nutrition.

[1] Biochem. Jour., 1927, xxi., 632.

CLEMENS PIRQUET.

THE world is the poorer for the loss of FREIHERR CLEMENS VON PIRQUET who, with his wife, was asphyxiated by misadventure last week in Vienna. His name is perpetuated in a tuberculin test which revealed for the first time the ubiquity of tuberculous infection in an urban community, an achievement in itself sufficient to deserve well of his generation. But PIRQUET—as he preferred to be known without the honourable prefix—was largely responsible for the development of the magnificent children's hospital attached to the University of Vienna, and it was he who collaborated with the British and American relief work in averting the worst horrors of starvation in the youthful population of Vienna after the war. PIRQUET worked out the ration which enabled the Save the Children Fund and the Society of Friends to provide a suitably balanced meal for many thousands of undernourished children at a cost to

their subscribers of only three-halfpence a head. The ideas which inaugurated this development of human physiology may have arisen in the minds of LIEBIG and BUNGE, but the conception of nutrition as an exact science, to which mathematical principles might be directly applied, was something that owed its existence to the enthusiasm and the amazing industry of PIRQUET, whose life was devoted to detailed study of innumerable factors bearing on human nutrition, and more particularly from the exogenous or dietetic point of view. The influence of his earlier work is reflected in the change which took place in current views on infant feeding and nutritional disorders towards the end of last century, the essence of the change being the attribution of increased importance to quantitative considerations. Much that is admirable in the Vienna and Berlin schools of pædiatrics bears the impress of his trend of thought. The opportunity came to test those theories by devising a system of rationing which should utilise the available resources, particularly of fats, with the maximum of efficiency; and they stood the test. Given an adequate supply of protein, the proportion of fat and carbohydrate in the diet was shown to be of little importance, and this principle was made the basis of the official scheme of rationing. It is probable, however, that PIRQUET'S name will be perpetuated, at any rate in this country, rather by the cutaneous tuberculin reaction than by his far more important works on nutrition and *Biometrik*. For the latter, while accepted by experts throughout the world as masterpieces of their kind, must of necessity be limited in the number of their readers by their great technicality and by the knowledge of mathematics which they demand. Whether the "Nem" system of feeding will gain wide acceptance is doubtful, but the mathematical relations which PIRQUET established between simple measurements, such as the sitting height, and nutritional requirements are likely to remain as the sound basis of further research on human nutrition. Prof. PIRQUET had accepted an invitation to read a paper on the prevention and cure of tuberculosis in early childhood before the Section of Diseases of Children at the forthcoming annual meeting of the British Medical Association in Manchester, and his untimely death will disappoint many who would have welcomed the opportunity of seeing in the flesh the virile and attractive personality of the Austrian nobleman, pædiatrist and humanist.



From the Weardale Press.

EXTENSION OF LANCASTER INFIRMARY. — Lord Derby last week laid the foundation-stone of a series of extensions of this hospital which has become inadequate owing to the demands of the wide area which it serves. The scheme, which will cost £75,000, provides for a new children's ward, a maternity ward, the substitution of a permanent building for a temporary structure added during the war, two eye wards, two theatres, extensions to the nurses' quarters, and other additions.

Annotations.

"Ne quid nimis."

THE KING.

AFTER an interval of more than a fortnight without the issue of any pronouncement by His Majesty's doctors the following official bulletin was issued from Craigweil House, Bognor, last Saturday, March 2nd, at 8.15 P.M.: "During the last fortnight His Majesty the King has made satisfactory progress. Weight and strength have increased, and sleep is refreshing. His Majesty is now able to read and apply his mind for short periods of time. We must, however, recall that one of the most anxious features of His Majesty's grave illness was severe exhaustion due to prolonged toxæmia. For this reason careful avoidance of any sustained effort of body or mind will be necessary for a lengthened period, in order to ensure that completeness of recovery which, although still some months distant, we confidently anticipate." The bulletin was signed by Sir Stanley Hewett and Lord Dawson of Penn.

NEW YEAR HONOURS.

THE list of those upon whom it was intended by the Crown to confer recognition upon the New Year's Day of this year has now been published, the delay, of course, being due to the illness of the King. The list is headed, as far as medicine and the allied sciences are concerned, with the name of Sir Berkeley George Andrew Moynihan, President of the Royal College of Surgeons of England, upon whom the signal honour of a peerage has been conferred. Moynihan has devoted his life to building up a school of surgery unique in this country, and in so doing has made a lasting contribution to the pathology of the living. Lady (Florence) Barrett, Dean of the London (R.F.H.) School of Medicine for Women, and President of the Medical Women's International Association, is created a Companion of Honour. The following two medical men have received the honour of knighthood—namely, Dr. Nasarvanji Hormasji Choksy, of Bombay, and Mr. Carrick Hey Robertson, of Auckland, N.Z. In the Order of the British Empire the K.B.E. is conferred on Dr. Charles Hubert Bond, Commissioner of the Board of Control, and the D.B.E. upon Miss Louise McIlroy, professor of obstetrics and gynæcology in the London (R.F.H.) School of Medicine for Women. Sir Walter Fletcher, secretary, Medical Research Council, has been created C.B. The C.M.G. has been conferred on Dr. J. H. L. Cumpston, Director-General of Health and Director of Quarantine in the Commonwealth of Australia; Dr. F. C. Madden, Dean of the Faculty of Medicine in the Egyptian University, Cairo; Mr. A. J. R. O'Brien, surgeon specialist in charge of the Gold Coast Hospital, and on Dr. A. T. Stanton, chief medical adviser to the Secretary of State for the Colonies. Mr. William Thomas Paulin and Mr. Albert Levy receive knighthoods for their services in a lay capacity to the London Hospital and the Royal Free Hospital respectively. Sir Arthur Robinson, Permanent Secretary to the Ministry of Health, receives a G.C.B., and Sir William McCormick, chairman of the University Grants Committee, a G.B.E. Among those created C.B.E. are Lt.-Col. J. K. S. Fleming, Deputy Director-General of the I.M.S.; Miss Frances Ivens, clinical lecturer in obstetrics and gynæcology in the University of Liverpool; Miss Beatrice Monk, matron, London Hospital; Miss Winifred Cullis, professor of physiology London (R.F.H.) School of Medicine for Women and Mr. William Nowell, Director of the Aman Research Institute, Tanganyika Territory. The O.B.E. has been conferred upon Dr. Norman Parsons Jewell, resident surgical officer, European Hospital Nairobi, Kenya, Dr. J. C. S. McDouall, director o Medical and Sanitary Services, Sierra Leone, Mis

Anne Emily Cummins, Lady Almoner, St. Thomas's Hospital, and Miss Isabella Drennan Sandifer, late matron, Ministry of Pensions Hospital, Newcastle; while the following receive the M.B.E.: Dr. Isabella Hardie Curr, Miss Ellen Amelia Cleary, Miss Nora Marie Cremen, Miss Margaret McPherson White, Miss Ethel Mary Cauty, and Miss Helen Cooper Hodgson. The C.I.E. has been conferred upon Lieut.-Colonel Charles Isherwood Brierley, Chief Medical Officer and Inspector-General of Gaols in the N.W.F. Province of India, Lieut.-Colonel Harold Holkar Broome, Principal of the King Edward Medical College, Lahore, Dr. Henry Tristram Holland, missionary in Baluchistan, and Lieut.-Colonel Robert Ernest Wright, professor of ophthalmology, Medical College, Madras. To Mr. Nowroji Jamshedji Bandorawala, P.M.O., Bikaner State; the Rev. Ernest Bell Sharpe, missionary superintendent; Purulia Leper Asylum, Bihar and Orissa; Dr. Pearl Smith Chute, Canadian Baptist Mission Hospital, Akidu, Madras; and Mr. John Hutchison, Church of Scotland Mission, Chamba State, Punjab, the Kaisar-i-Hind medal of the First Class has been awarded for public services in India. The barony conferred upon Sir Berkeley Moynihan is the second received by a doctor in direct reward for professional work and in recognition of the discharge of official duties, and we congratulate him upon his new and high distinction.

EFFECT OF MALARIAL THERAPY ON THE BRAIN IN GENERAL PARALYSIS.

IT is the boast of modern scientific medicine that the rational treatment of disease is replacing the old empiricism. But in the treatment of general paralysis the process has recently been reversed, and an empirical method of treatment by the induction of malaria has come to the aid of the apparently more scientific attempts to kill the spirochætes in the brain by the use of well-established antisyphilitic remedies. When used alone these have proved of little value. As Surgeon Rear-Admiral E. T. Meagher[1] pointed out in a recent discussion at the Royal Society of Medicine, only about 4 per cent. of patients so treated could be discharged from asylums. When to this treatment malarial therapy was added the number who could return to a fairly normal life rose to 20 or 25 per cent. Attempts have lately been made on the Continent and in America to find out the method whereby this cure is effected. For this purpose careful histological examinations have been made of the brains of all patients dying either during or after malarial treatment, and the appearances found in these brains have been compared with those of general paralytics who had not undergone this treatment. The evidence obtained in this way has recently been summarised by R. B. Wilson[2] who himself examined 47 brains in Jakob's laboratory at Hamburg. He found that during the first three to six weeks after the malarial paroxysms there is an exacerbation of all the inflammatory changes in the cerebral cortex. The meningeal and perivascular cell exudates become more abundant, and in addition there is in the earliest stages an accumulation of cells even along the capillaries. There is also an increased number of rod cells and of iron demonstrable by the Prussian blue reaction. After the sixth week these changes recede and gradually very little evidence of inflammation is left except the presence of macrophage cells in the meninges, which are rather evidence of repair than of inflammation. After six months there was in certain cases evidence of recrudescence of the infection; but the brains of these patients did not show the usual diffuse lesions of general paralysis. Instead of this, there were in the cortex and basal ganglia numerous localised inflammatory areas, many of which resembled the early stages of gummatous formations.

These anomalous cortical changes, and the fact that subcutaneous gummata have developed in several general paralytics after malarial treatment, have led to a supposition that the effect of malaria on the disease is to change it from a malignant neurosyphilitic process to a more benign tertiary type. This supposition does not, however, receive Wilson's whole-hearted support. For whereas spirochætes disappear very rapidly from the brain after malaria and were only found by him in one case out of 25 which died in the first six months after treatment, they were found in five out of six brains in which this peculiar relapse had taken place; that is to say, they were as commonly found as in untreated general paralysis, whereas in tertiary syphilis they can very seldom be demonstrated. He considers that no hard-and-fast-dividing line can be drawn between typical general paralysis and tertiary brain syphilis; the two processes tend to merge into one another. But they "represent differences in the relationship between the defence mechanism of the body and the spirochæte."

To sum up the evidence obtained from these histological examinations, it seems certain that malarial treatment, either directly by the pyrexia or by stimulating the formation of antibodies, brings about the death of the majority of the spirochætes in the brain. The toxins so set free cause a severe inflammation of the cerebral cortex, but owing to the absence of living spirochætes this is rapidly recovered from. The process is, in fact, comparable to the vaccine treatment of a chronic indolent affection. After six months or more, if spirochætes remain alive in the brain, they may cause further inflammatory changes, but these tend to be more of a localised tertiary form than of a diffuse general paralytic form and probably respond more readily to ordinary antisyphilitic treatment. This appears to be the practical outcome of these researches, and the necessity for continuing antisyphilitic treatment after the patient has undergone a malarial cure was insisted on by several speakers at the discussion at the Royal Society of Medicine. It seems probable that with fuller understanding and improved technique, the percentage of cures in this country will rise considerably above the 25 per cent. quoted by Rear-Admiral Meagher.

[1] THE LANCET, Feb. 23rd, p. 390.
[2] Brain, 1928, li., 440.

RADIUM AND LONDON HOSPITALS.

AT the end of last year Sir Otto Beit offered a sum of £50,000 to King Edward's Hospital Fund to be spent in the purchase of radium for the service of the London hospitals, and at a reception held at the Wellcome Historical Medical Museum last Friday (March 1st) Sir John Rose Bradford set out on behalf of the Committee of the Fund the principles on which the radium is to be allocated. The first question to be determined, he said, was to ascertain what quantities of radium were available in the London hospitals at the present time. In some cases the radium is the property of the hospital, in others it has been obtained on loan, but in no case does any one hospital in London possess quantities approaching in amount to those available at some treatment centres on the Continent of Europe. Even with Sir Otto Beit's gift and the more recent gift of £25,000 to the London Hospital, the quantity of radium at any one hospital will not be equal to that available at some of these centres. Having ascertained the amount of radium at present at the services of the London hospitals, the King's Fund Committee decided to provide a certain number of hospitals with a quantity of radium sufficient to enable them, with their own supply, to function as "radium centres," that is to say, not only to treat their own patients but to be available for a supply of radium emanation to other hospitals; and, further, so far as the amount of radium at the disposal of the Fund permits, to distribute among hospitals coming within the donor's description a supply of radium sufficient to enable them to treat, if not all, a certain number of their patients requiring radium treatment. Some special hospitals have greater need for the use of radium than others; thus, a hospital dealing with diseases of women, or with diseases of the throat, has a greater immediate need than a hospital dealing with diseases

of children. The amounts of radium already in the possession of the hospital have been taken into consideration, and finally, the provision made for the use of the radium and the existence at the hospital of some member of the staff with special and expert knowledge of its use. Three amongst the twelve teaching hospitals already have, or will shortly have, quantities of radium of their own sufficient in amount to provide radium emanation, and these will not at the present moment share in the allocation of the King's Fund radium. In one other case an allocation will be made sufficient in amount with the radium available at the hospital for this hospital also to provide emanation, and thus four radium centres will be available. After the allocation all the teaching hospitals will have quantities of radium adequate to fulfil some, if not all, of their needs. The hospitals have been notified of the provisional allocation, and have been asked to inform the King's Fund of their scheme for the use of the radium, and of the measures they propose to take for the custody of the radium. The radium will be on loan to the individual hospital for a period of one year, subject thereafter to withdrawal on one month's notice. The King's Fund radium is to be available for all hospital patients, both ordinary and pay-bed, but it is not to be removed beyond the hospital precincts without written authority from the King's Fund. Rules for the use and care of the radium are to be submitted by the individual hospitals to the King's Fund, and the Fund is to receive periodical reports from the hospital showing the stocks of radium, the milligramme-hours of use, and the number of patients treated. Sir John Rose Bradford remarked, in conclusion, that much larger quantities of radium than any yet available are required for purposes of research as to the best methods of treatment. In addition to the great cost of radium itself, the cost of placing it in suitable containers for its use in treatment is exceedingly high; hence about a quarter of the outlay is expended, not on the element itself, but on the container and on the expense incurred in placing the radium in the container.

THE ÆTIOLOGY OF ACCIDENTAL HÆMORRHAGE.

ANTE-PARTUM hæmorrhage from premature separation of a normally situated placenta has been recognised for 150 years, and until this century it was assumed that some form of trauma was always its cause. The condition was distinguished from ante-partum hæmorrhage due to placenta prævia by the title "accidental" as opposed to "unavoidable" hæmorrhage, and these names have been retained in this country despite the general recognition that toxæmia plays an important part in its causation. "Toxæmia of pregnancy" is a vague term, and may be used to denote various pathological conditions. Prof. F. J. Browne and Dr. Gladys Dodds[1] have brought forward valuable experimental evidence to show that the one significant predisposing cause of accidental hæmorrhage is chronic nephritis. Their work was the result of observations on a rabbit 20 days' pregnant (corresponding to about six months' pregnancy in man). A culture of *Bacillus pyocyaneus* was injected into the rabbit, and four hours later there was profuse revealed and concealed hæmorrhage. The animal was killed, and on section the kidneys showed not only acute nephritis from the bacterial infection but also an unusual chronic interstitial change. The significance of this chronic change was at first not understood, but later it was discovered that if chronic nephritis be induced in a rabbit by repeated injections of sodium oxalate, the injection of an irritant such as uranium nitrate or *B. pyocyaneus* will bring about accidental hæmorrhage during the second half of pregnancy. In the absence of chronic nephritis, the injection of uranium nitrate or *B. pyocyaneus*, although it produces acute nephritis, is rarely sufficient to cause ante-partum hæmorrhage. In some animals with chronic nephritis, ante-partum hæmorrhage occurred spontaneously during the second half of pregnancy. The functional efficiency of the liver was found to be normal in the experimental animals, and it was also found that in these chronic nephritic rabbits albumin may be absent from the urine between pregnancies and during the early part of pregnancy, only appearing in the urine before the onset of spontaneous hæmorrhage. From their observations, Browne and Dodds think that bleeding is due to accumulation of poisons in the blood which the kidneys are unable to excrete; an alternative explanation is that the kidney has normally a metabolic function, which is interfered with in chronic nephritis. Their work has an important bearing on the so-called recurrent toxæmias of pregnancy, and careful inquiry into the previous history of cases of accidental hæmorrhage will no doubt throw further light on this important subject.

[1] Further Observations on the Ætiology of Accidental Hæmorrhage and Placental Infarction, Jour. Obst. and Gyn., Brit. Emp., 1929, xxxv., No. 4.

THE TRAFFIC IN DANGEROUS DRUGS.

THE report of the twelfth session of the League of Nation's Advisory Committee on the traffic in opium does not vouchsafe very reassuring information. Neither Persia nor Turkey, which between them produce a million kilogrammes of opium annually, furnish any report to the League. The latter State, like Soviet Russia, is, of course, not even a member of the League. Such serious gaps in a conspectus of the world-produce of opium and the commerce in dangerous drugs render the efforts of the Advisory Committee and the Central Control Board largely ineffective. Moreover, one-half of the States which are members of the League, including six which are represented on its Council, have neglected, up to the present, to ratify the Geneva Convention of 1925, and this is said to cause "a grave hindrance" to the League's work in controlling the traffic in dangerous drugs. The new Central Opium Control Board held its first meeting during the sessions of the Advisory Committee, but the relations between the duties of the one body and the other remain to be determined. Illicit traffic in opium, morphine, heroin, and cocaine continues to an alarming extent. Full details are furnished in the report of the recent exposure by the Netherlands Government of a wholesale system of illicit traffic carried on by the Naarden Chemische Fabriek at *Bussum*, whereby enormous quantities of the scheduled drugs imported chiefly from Switzerland and Germany were transmitted for the most part to the Far East. There were thus exported in 1927-28, 950 kilogrammes of morphine, 3000 kilogrammes of heroin, and 90 kilogrammes of cocaine; indeed, it is estimated that this centre of illicit international traffic, now suppressed, dealt with about half the total annual world-production of heroin. The bulk of these contraband exports found their way to China, and the Japanese delegate, Mr. Sato, was justified in his assertion that "it was impossible to deny the justice of the Chinese demand that the flood of morphine and heroin into China should be considered at the same time as the flood of opium out of that country."

RENAL BACK PRESSURE.

THE pathology of renal deficiency associated with prostatic obstruction has long interested urologists and has lately been reinvestigated by H. A. R. Kreutzmann[1] of San Francisco. In the method he employs the first step is to obtain a cystogram so as to determine whether there is reflux into the ureter. If reflux is absent on both sides catheters are inserted into the two ureters and sodium iodide is injected. If reflux is present on one side only a pyelogram is made of the opposite intact side. Kreutzmann finds

[1] Jour. Amer. Med. Assoc., Feb. 2nd, 1929, p. 213–215.

that in long-standing obstruction in which patients show clinical evidence of back pressure, there is often no reflux at all. Where this is so, however, pyelography reveals conspicuous dilatation of both ureters and renal pelves. Even in patients with reflux on one side he demonstrated the presence of dilatation of the upper urinary tract on the side in which reflux had not occurred. The conclusions drawn from his cystograms and pyelograms are as follows: (1) The cause of upper urinary tract dilatation in obstructive lesions of the neck of the bladder and of the urethra in adults is a stenosis of the intramural portion of the ureter. (2) This constriction is due to hypertrophy of the musculature of the bladder. (3) When reflux is present, the increased intravesical pressure tends to keep the upper urinary tract dilated to its maximum. (4) After removal of the urethral obstruction, the wall of the bladder loses its hypertrophy, the stenosis disappears, drainage is improved, and the ureters and renal pelves return to normal. Kreutzmann's explanation of back pressure in the kidneys is, therefore, different from that of Tandler and Zuckerkandl. These investigators laid stress on the anatomical fact that the vas deferens passes in front of the ureters, between the ureter and bladder. They suggested that as the prostate enlarges and pushes up the floor of the bladder the vas deferens remains as a fixed point around which the ureter becomes looped. Amongst reasons why Kreutzmann finds this explanation unsatisfactory is his observation that relief from back pressure is always gained by the use of an indwelling catheter. If the ureteral obstruction were due to the pull of the vas on the ureter such relief would not be expected. Moreover, Tandler and Zuckerkandl's explanation could not possibly apply to cases of median bar formation without general enlargement of the prostate and to obstruction from urethral strictures, as in those cases there is no change in the relation of the vas to the ureter.

THE ROMANCE OF INDUSTRIAL MEDICINE.

THERE can be few more romantic chapters in the tale of human advance than that of the inception and growth of medicine in industry, and Sir Thomas Legge made an enthralling story of his "Thirty Years' Experience of Industrial Maladies" in three Shaw lectures to the Royal Society of Arts, ending last Monday. The most exciting day of his life, he said, was that on which he was able to connect posterior cortical cataract with the exposure to glare in a glass-blowing factory. Yet in that he was only confirming the observations of a half-blind trade-union official. Among 513 glass-blowers he found that 64 had cataract in the right eye and 72 in the left; among 278 workers not exposed to glare, 14 had it in the right and 13 in the left. The left eye of the glass-blower is more often turned to the "glory hole" than the right, so the inference of occupational disease was obvious. The proof was yielded by an investigation into the incidence of cataract among Hearts of Oak members—0·6 per cent.—and among the Yorkshire Glass Bottle Makers' Society—30 per cent.—and the North of England Glass Bottle Makers' Society—66·6 per cent. Sir William Crookes threw himself into the problem with immense enthusiasm, and at last succeeded in finding a glass which would cut off the injurious rays. But here, at once, is an example of one of Sir Thomas Legge's two cardinal precepts of industrial medicine; unless you can bring something external to bear on the workman—something over which he has no control—you will not succeed. For the workmen soon got tired of wiping their sweat-fogged spectacles, and Crookes lenses were little used. Then came the "something external" with the perfection of an automatic bottle-maker, which gathers up the molten glass, and blows it into bottle shape at the rate of 40 a minute, enabling three men to do the work of forty. A delightful coda to the story is the fact that the odd 37 men were not thrown out of work, for the machine, with all its magic powers, failed to insert the glass marbles into ginger-beer bottles, and the human hand was still needed for that. Trade-union officials have helped in many other departments of industrial medicine. It was a secretary who demanded of a professor of botany in Liverpool what it was in African box-wood that made the shuttle-makers mazy and sleepy at their work. With the help of Prof. Sherrington, an alkaloid powerfully depressant to the heart was isolated from the wood and *Gonomia kamassi* poisoning was scheduled as an industrial disease. It is a rare one now, for the publicity of scheduling it led to the substitution of other woods in the shuttle industry. A trade-union officer, again, first drew attention to the skin cancer of the briquette-makers. Miners' ailments account for 90 per cent. of the cases receiving compensation for the 36 scheduled diseases; nystagmus, beat hand, beat elbow, and beat knee, together with silicosis, by many hundreds head the list of cases receiving compensation. Nystagmus alone costs over a million pounds in compensation, for about 1 per cent. of our million miners have nystagmus. We compensate always; some continental countries do not compensate at all, others only if there is total incapacity. Sir Thomas Legge upheld the views of J. S. Haldane, that the disorder is due to the strain—ending in psychoneurosis—of having to look at the black coal face, which absorbs over 90 per cent. of the light that falls on it, and that men might well be better continuing at work than worrying over their eyes above ground. For nystagmus no remedy is as yet in sight. Next in order of frequency come lead poisoning and dermatitis, and these at least are preventable by care. The trouble is that too many workpeople demand cure when cure is impossible, and will not ensure prevention when prevention is easy. Sir Thomas Legge illustrated vividly how familiarity breeds contempt, and emphasised his second maxim: unless and until the employer has done everything in his power, the employee can do nothing to protect himself. How far that "can" should read "will" is perhaps open to argument, but the fact remains nevertheless true. Several kinds of industrial disease, such as trinitrotoluene poisoning and grindstone silicosis, are fine examples of what can be done to protect workers by the coöperation of scientific investigators and employers, but others remain almost unaltered during many years. New risks are appearing with every new industry; when the Commission sat, poisoning by manganese and tetrachlorethane were unknown. Mr. Ben Tillett, the chairman, hoped to see the time when names like Haldane and Collis were more revered by the workers than that of any politician; Sir Thomas Legge looked to the day when there should be no industrial disease. The one might well be the means of bringing about the other. Meanwhile there is a wide field of urgent work for all concerned.

INFECTION IN MULTIPLE ARTHRITIS.

RELATIVELY few cases of multiple infective arthritis are due to specific infection, gonococcal, luetic, or tuberculous; in the great majority no specific germ can be found. Cultures from the synovial fluid and periarticular spaces of infected joints rarely yield positive findings; cultures from the blood, even when taken during febrile attacks, are usually negative. L. G. Hadjopoulos and E. Burbank [1] ascribe this non-success to the presence of antibody in the blood, and state that by neutralising this antibody they have obtained positive cultural findings in 29 out of 145 arthritic cases. In 15 cases streptococci were obtained; these were injected into rabbits, guinea-pigs, and mice, and after one or two months joint swellings took place. X ray photographs of the affected joints show atrophy of cartilage and periarticular infiltration of the soft tissues. No deaths occurred, so that no histological data are available, and until more convincing evidence is

[1] Journal of Bone and Joint Surgery, 1927, ix., 278.

adduced judgment will naturally be reserved. In the absence of any discoverable virus around the joints or in the blood, lesions in distant foci have come to be regarded as likely sources of infection, and clinical bacteriologists are largely occupied with the culture of bacteria and preparation of vaccines from reputed foci. It is true that the finding and removal of an infection in tonsil or teeth or elsewhere may not cure or influence the course of the complaint. In a series of cases observed at the Mayo Clinic, J. G. Meisser and S. Brock [2] found more than half the patients studied had had certain foci removed before coming to the clinic. In many instances there are several foci to be discovered and eliminated before arrest or improvement in the disease takes place. While all such foci may not be relevant, their removal, although having no direct effect on the progress of the disease, may act indirectly by improving the general health.

THE PATHOLOGY OF ANÆSTHETIC FATALITIES.

FEW kinds of post-mortem examinations are so disappointing as those that follow a death under anæsthesia if the anæsthetic has really been the cause of death. It may be truly said that the more the anæsthetic has done towards bringing about the death the less will be the post-mortem evidence. In a death purely due to an anæsthetic—in the rare case in which a normal person dies from an anæsthetic before being operated on—there is probably no morbid appearance to show the pathologist how death was caused. On March 1st Dr. Gerald Slot demonstrated to the Section of Anæsthetics of the Royal Society of Medicine how very small a proportion of the cases investigated as deaths under anæsthetics belong to this category—how few, indeed, of these cases, although deaths *under* anæsthetics, are deaths *from* anæsthetics. He divided the numerous cases which he had investigated into five groups: (1) status lymphaticus; (2) death due to a definite anæsthetic accident (e.g., wrong adjustment of a Junker inhaler); (3) death due to myocardial affections, arterio-sclerosis, &c.; (4) death due to the grave condition of the patient before operation (e.g., advanced peritonitis); and (5) asphyxial death. Only in Class 2 can the mortality be definitely attributed to the anæsthetist. In many cases Dr. Slot found that surgical shock was the chief factor; in others an unsuspected pulmonary embolism had been found, or acute pulmonary œdema or coronary thrombosis. He devoted a good deal of his paper to status lymphaticus, laying down definite and incontrovertible appearances that must be present post mortem to justify the application of the term. He had no doubt at all of the existence of the condition, which was sometimes found, quite apart from anæsthetics, as the sole explanation of a sudden and unexpected fatality. As a preventive measure for patients in whom the condition was suspected beforehand Dr. Slot believed efficient calcium administration to be probably of real value. Oral administration, unless in large doses on an empty stomach, was almost useless and the intravenous route should be employed. Dr. Slot alluded to necropsies which he had made on patients who had died after a spinal anæsthetic. There again the findings, qua anæsthetic, were entirely negative.

A GIPSY ENCAMPMENT.

CROWBOROUGH, in Sussex, has long been suffering from the presence of a large gipsy encampment, which has caused a good deal of annoyance to residents in the locality. Though from time to time there have been serious feuds among the gipsies, resulting in various charges before the magistrates and even higher tribunals, the main complaint against them arises from the insanitary condition of the piece of common land they occupy. Repeated attempts have been made to force these gipsies to provide sanitary conveniences and to abate nuisances, but notices served upon them have not been taken seriously. Without proper water-supply, or facilities for the disposal of refuse, and without any sanitation at all, their area not only has become unfit for human habitation, but is also an offence to all who live near the camp. The sanitary authority—in this case, the Uckfield Rural District Council—has always a difficult task in dealing with such people, for they often threaten violence against any official who is unaccompanied by police officers; but at Crowborough the magistrates are supporting the authority in the hope of bringing about a better state of affairs, and ridding the town of what is described as a menace of many years' standing. The Council have taken proceedings against the gipsies, and at Mark Cross Petty Sessions on Feb. 26th no fewer than 17 were summoned for being the owners of vans, tents, and similar structures, and allowing them to be used in such a way as to be a nuisance or injurious to health. The magistrates, under provisions of the Public Health Act, 1925, made an order prohibiting the use of vans, tents, and structures for human habitations in the area, and gave the gipsies two months in which to quit. The gipsy problem is a big one, and always bristles with difficulties arising from their customs and habits, to say nothing of their view of the law. With the decline in horse-dealing and other nomadic arts, an increasing number are settling down to the ordinary life of the towns. Those who still follow the vagabond life are most popular with the public health authorities when they are moving to somewhere else, and where they cause a standing nuisance there is a growing disposition to deal with them peremptorily and exercise to the full the ample powers provided under the Public Health Acts.

WE have just received a copy of the Medical Register for 1929, which contains the names and addresses of the 54,252 persons entitled to practise medicine and surgery under the Medical Acts of 1858 and 1886, an increase of 661 over the number of names in the previous year. During the twelve-month 859 names were added by registration in England, 404 in Scotland, 217 in Ireland, 168 to the Colonial List, and 8 names to the Foreign List—1656 in all. During the same period 1038 names were removed from the Register, 845 on evidence of death, 1 on ceasing to practise, 4 as the result of disciplinary action by the General Medical Council, and 188 who failed to respond when desired to do so by registered letter. Fify-four names were restored to the Register during the year. The 102 preliminary pages of the volume, which contain warning notices and summaries of the Medical and Dental Acts remain unaltered except for the omission of the Province of Quebec from the list of British Possessions qualified to grant degrees registrable in the Colonial List. This table is dwindling from year to year as the Canadian Provinces fail to reciprocate. Japan and Italy remain the only foreign countries whose degrees are still registrable in the Foreign List.

THE Oxford Ophthalmological Congress will assemble this year at Keble College on Wednesday, July 3rd, and meetings will continue until the 6th. On Thursday Prof. Joseph Meller, of Vienna, and Dr. J. S. Fraser, of Edinburgh, will open a discussion on Diseases of the Lacrymal Apparatus; on Friday morning Miss Ida Mann will deliver the Doyne Memorial Lecture, her subject being the Vascularisation of the Vertebrate Eye; and on Friday afternoon a discussion on Ocular Manifestations found in Fractures of the Skull will be opened by Mr. Hugh Cairns and Mr. Charles Goulden. Further particulars may be had from the hon. secretary of the Congress, Mr. C. G. Russ Wood, 12, St. John's-hill, Shrewsbury.

[2] Mayo Clinic, Collected Papers, 1923, xv., 990.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXV.—REPORTS ON MATERIAL CURETTED FROM THE UTERUS.

THE interpretation of material curetted from the uterus is sometimes difficult, especially when carcinoma of the body of the uterus is suspected or a possible recent abortion has occurred. The operation is performed for a variety of reasons—for diagnostic purposes, to remove retained products of conception, to elucidate and cure cases of unusual hæmorrhage. In most cases something is removed which may present characteristics easily recognisable by the naked eye, but often microscopic examination alone reveals the true nature of the material. As it often happens that the future treatment of the case depends upon the verdict pronounced after a microscopic investigation, it is important that this verdict should be definite, not ambiguous, and, above all, correct. An indefinite report on curetted material is worse than useless; for instance, it is not unusual to receive a report like the following: "This material shows glandular elements and stroma, the former showing much irregularity in outline and active cell proliferation. Although these appearances are not typical, a malignant growth cannot be excluded." Such a report as this, only too common, lands the surgeon in a dilemma from which he finds it hard to extricate himself or to do justice to his patient. Usually he decides to take no risk of missing a carcinoma of the body of the uterus, and so performs a panhysterectomy, only to find no evidence of growth after removal! As a proof that this is no exaggeration a recent experience of my own is worth recording. A few weeks ago sections of curetted material from five patients were submitted to me for confirmation; in all of these a carcinoma of the body of the uterus had been diagnosed, in three a hysterectomy had been done, and in the other two this operation was contemplated. All the sections showed simple thickening of the endometrium, and in none of them was there any evidence of a malignant growth. This is not by any means an isolated experience and must be happening frequently in all parts of the kingdom. The curious point is that, in my experience, the opposite hardly ever occurs—namely, that a malignant growth is mistaken for a simple condition of thickened endometrium.

The Collection of Material.

The reasons for these mistakes more often lie in the character of the material sent to the pathologist than to imperfect knowledge on his part of uterine histology. Only too often curetted material is improperly preserved, the sections are badly cut and stained, and are not even properly cleared before they are mounted. Realising that uterine histology is difficult at all times, proper preservation and the best sections possible are essential if the pathologist is to have a fair chance of making a correct diagnosis. All fragments should be collected *free from blood* and placed in fixing fluid, preferably 10 per cent. formalin in normal saline solution, but failing this, undiluted methylated spirit does very well. Fragments left soaking in blood and serum for 24 hours become macerated, epithelium is shed, nuclei lose their staining properties, and the specimen is hopeless from the pathologist's point of view. I have seen fragments sent through the post merely folded in paper, like a powder, so that on arrival they are quite dry, hard, and sticking to the paper.

The Naked-eye Characters of Curetted Material.

Thickened Endometrium.—If thickened endometrium is removed with a sharp curette, pinkish-grey gelatinous *strips* from one to two inches long appear. They are usually about 3/16 in. wide and vary in thickness from 1/16 in. to ¼ in. These are easily made manifest by placing each curette-full upon a sloping towel, when the blood will run away and leave the strip of mucous membrane unencumbered.

Carcinoma.—When, on the other hand, fragments of carcinoma are removed, the curette brings away masses of material which have the consistence of a ripe pear, and which fill up the eye of the curette more or less completely. *There are no strips.* It sometimes happens where the growth is small that only minute fragments are removed, and these should always be regarded with suspicion because they *are* fragments and not gelatinous strips. These remarks apply equally to the curettage of a squamous epithelioma of the cervix and to that of a columnar-celled carcinoma of the body of the uterus.

Chronic Metritis.—In cases of chronic metritis of the subinvolution type the endometrium is usually not thickened and the curette removes very little except pulverised débris. This applies to cases of long-standing chronic metritis, years after childbirth and usually after the age of 40 has been reached. In cases of recent subinvolution following abortion or full-time labour, thickened endometrium, brought away in strips, may be all that is found.

These three classes of cases comprise the great bulk of the curettages performed for diagnostic purposes in women round about the menopause, and it will be seen that the naked-eye appearances of the material removed are usually quite characteristic and do not require microscopic examination except for purposes of confirmation. One axiom in this connexion cannot be too strongly emphasised, and that is that carcinoma of the body of the uterus practically never occurs until after the age of 45, or until after the menopause, and that carcinoma of the body of uterus diagnosed in a woman below the age of 45 should be regarded with grave suspicion, and no radical operation should be performed until the diagnosis has been confirmed beyond all question. Let it be remembered that there is never any urgency to perform a hysterectomy for carcinoma of the body of the uterus; the growth is slow-growing, the prognosis is good, even if symptoms have been present for months. The delay of a week or two will make no difference to the outlook for the patient.

Products of Conception.—When curettage is performed for the removal of suspected retained products of conception, narrow-bladed swab forceps should be used before the curette. These should be passed up to the fundus, then withdrawn half an inch and opened as widely as the uterine cavity will permit. When closed again the forceps will often grasp a fragment of placenta, a placental polypus, or old adherent blood-clot. This, when removed, has certain characters which usually reveal its nature. The material is fleshy and peculiarly coloured; part of it may be purple, part crimson, and part yellow. These colours are practically never seen in any material except retained products of conception. The microscope will confirm the diagnosis by revealing chorionic villi, decidual cell masses, fibrin, and blood-clot.

Chorionepithelioma.—In the very rare instance of the occurrence of a chorionepithelioma following hydatidiform mole, abortion or full-time labour, the curette is a dangerous instrument on account of the copious hæmorrhage which follows its use. Nevertheless it has to be used for diagnostic purposes, and the only safeguard is rapidity in operating, followed by immediate tight plugging of the uterus. The material removed looks like blood-clot and is often offensive from decomposition. Only the microscope will reveal a small area containing the new growth. The use of swab forceps before curetting is advisable in cases other than those of retained products of conception. They will often bring away an unsuspected polypus from the body of the uterus, particularly in cases in which there has been irregular intermenstrual bleeding as well as menorrhagia. The curette may miss a polypus, but the swab forceps very rarely does so. It is often taught that the

uterus should be explored by the finger before curettage, but this is rarely possible or advisable except after recent abortion or labour. It is practically impossible to dilate the cervical canal sufficiently to admit the finger without lacerating the internal os. The latter occurrence is not devoid of danger since very severe hæmorrhage has followed it, to say nothing of the risk of infecting the parametric cellular tissue.

The curette will not remove small submucous fibroids, but will always reveal their presence. As they project into the uterine cavity the curette gives the sensation of bumping over them. Also, the curette will sometimes reveal a fibroid in process of extrusion and becoming polypoid, by passing up by the sides of it at one time or impinging on its lowest portion at another. These findings, combined with a careful bimanual examination, will usually reveal whether more than one fibroid is present, and will assist in deciding upon future treatment, whether the tumour can be removed by vaginal myomectomy, abdominal myomectomy, or hysterectomy.

Microscopic Appearances of Curetted Material.

It is hardly possible here to enter fully into the histological appearances of all the tissues met with during the operation of curettage, but a few points may prove to be of interest and value.

Thickened endometrium, whether due to the normal changes brought about during the menstrual cycle, or to pathological changes such as result from infection or recent subinvolution, presents a great variety of appearances and constitutes the chief difficulty in the study of sections of curetted material. The glands vary enormously in size, tortuosity, and in the appearance of their lining epithelium. In the menstrual thickening the glands are regularly tortuous, dilated and filled with secretion, whilst the stroma cells are enlarged and resemble miniature decidual cells. They are, however, never as large as the true pregnancy decidual cells. The gland epithelium is very regular, always in a single layer on a basement membrane. In pathological stages, the so-called endometritis, much greater complexity of the glands may occur. They may exhibit great irregularity in shape and size, sometimes being locally dilated and cystic. In recent abortion cases, without obvious retained products of conception, the great irregularity of the glands constitutes the chief pitfall in uterine pathology. They are often mistaken for the alveoli of a columnar-celled carcinoma and wrongly diagnosed as such. This mistake, however, should not occur, because a careful scrutiny will show that everywhere the epithelium is in a single layer, always on a basement membrane, and that there is no uterine muscle in the fragments to indicate that infiltration of the uterine wall has occurred. Further, if it be remembered that carcinoma of the body of the uterus almost never occurs before the menopause that fact alone will prevent a hasty and erroneous diagnosis.

Cervical polypi removed by the curette are really small adenomata composed of glands, connective tissue, and blood-vessels. They occasionally present puzzling appearances near their lowest pole, where they hang down into the vagina. At this point there is a tendency for their normal columnar epithelium to undergo metaplasia to a squamous type, and when seen near the orifice of glands sometimes gives a spurious appearance of dipping down into the stroma. This quite normal and harmless change is often diagnosed as an early squamous epithelioma, and a hysterectomy is done or advised. Mucous polypi of the uterus never under any circumstances become malignant, but, of course, a malignant growth may commence near by and destroy them.

Retained products of conception are easy to recognise, being composed of chorionic villi, decidual masses, and blood-clot. There are, however, certain cell elements seen in sections of uterine mucous membrane after recent abortions or full-time delivery, which raise a suspicion of chorionepithelioma. These cells are large, multinucleate, and often degenerate, usually single and associated with necrotic debris. They really represent fragments of syncytium from necrotic villi and are quite common appearances.

Chorionepithelioma is only to be diagnosed when definite masses of active syncytium and rapidly proliferating Langhans cells are seen in juxtaposition, invading uterine wall on one side and leaving a trail of blood-clot and debris on the other.

Decidual masses alone may be removed by the curette, without any villi; in such a case it is impossible to say, from the microscopic appearance, whether the pregnancy has been intra- or extra-uterine.

Conclusion.

In the presence of actual malignant growths such as squamous epithelioma of the cervix or columnar-celled carcinoma of the body of the uterus, it cannot be too strongly emphasised that it is the general appearance rather than upon individual cell elements upon which the diagnosis is based. Cervical cancer is so typical that it can hardly be overlooked, but it must be remembered that the commoner forms show very few, if any, cell-nests or keratinoid changes. In columnar-celled carcinoma it is the extreme complexity of the epithelial alveoli, the irregularly proliferating epithelium often in more than one layer, the presence of many mitotic figures in the nuclei and, above all, the presence of smooth muscle and fibrous tissue in the growth indicating invasion of the uterine wall which serve at once to establish a diagnosis.

Amongst rare growths discovered by the curette, sarcoma is found occasionally, round-celled, spindle-celled, or mixed-celled, and is generally quite obvious. In any doubtful case, Van Gieson's stain will usually demonstrate at once the presence or absence of fibrillated connective tissue and smooth muscle, and will thus enable a fibromyoma to be distinguished from a sarcoma.

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The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. (D.) A. C. Bloomer to be Surg. Lt.-Comdr. (D.).

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. H. J. Crossley, having attained the age for compulsory retirement, is placed on ret. pay.

Maj. C. W. O'Brien to be Lt.-Col, vice Lt.-Col. H. J. Crossley.

Temp. Capt. C. I. Hannigan relinquishes his commn.

E. J. Curran to be temp. Lt.

ARMY DENTAL CORPS.

Lt. W. McAndrew to be Capt.

REGULAR ARMY RESERVE OF OFFICERS.

The undermentioned, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.: Col. E. T. F. Birrell, late R.A.M.C.

TERRITORIAL ARMY.

Capt. A. H. D. Smith to be Maj.

E. C. Woodhead (late Offr. Cadet, Univ. of Lond. Contgt., Sen. Div., O.T.C.) to be Lt.

Supernumerary for Service with O.T.C.: G. L. Montgomery to be Lt., supern. for serv. with Med. Unit, Glasgow Univ. Contgt., Sen. Div., O.T.C.

The King has conferred the Territorial Decoration upon Lt.-Col. J. K. Lund and Maj. H. J. D. Smythe.

ROYAL AIR FORCE.

C. Crowley, P. J. McNally, and A. E. Vawser are granted short service commissions as Flying Officers.

INDIAN MEDICAL SERVICE.

Lt.-Col. E. B. Munro retires.

Capt. H. Williamson to be Maj.

Lt. C. A. Bozman to be Capt. (prov.).

Temp. Lt. Kailash Nath Tandon to be Temp. Capt.

Temp. Lt. Hasibul Hasan Khan relinquishes his temp. commn.

The King has approved of the appointment of Col. T. G. F. Paterson, I.M.S., to be Honorary Physician to His Majesty, and Col. E. F. Mackie Honorary Surgeon.

Special Articles.

AN INQUIRY INTO ASTHMA.

OBSERVATIONS AT EDINBURGH.

DURING the past eight years a group of workers has been collecting information about asthma in the Edinburgh area. The committee, which consists of Dr. D. M. Lyon, Lieut.-Colonel A. G. McKendrick, I.M.S., Lieut.-Colonel W. F. Harvey, I.M.S., Dr. J. S. Fraser, Dr. R. Cranston Low, Prof. J. Lorrain Smith, and Prof. J. C. Meakins, has sent us the following summary of its findings:—

An analysis has been made of the records obtained from 404 patients suffering from asthma who have been investigated in one of the charges of the Royal Infirmary of Edinburgh during the past eight years. The patients may be regarded as a fair sample of the asthma community, as no special selection was attempted. For the most part they belonged to the hospital class, but a few doctors, students, and nurses were also included. In one respect the sample is open to objection. The proportion of patients under 10 years is less than might be expected, since most young children in this area are dealt with in a special hospital. Between 10 and 50 years the number of asthmatics in each age-group is fairly uniform, but over 50 the numbers rapidly diminish.

Sex.—The series included 215 males (53·2 per cent.) and 189 females (46·8 per cent.), a smaller preponderance of males than is usually described. Between the years 10 and 20 there was some excess of males over females (61 : 31), from 25 to 30 there were 28 females to 14 males, and from the age of 45 to 50 males were again in excess (25 : 12). In other age-periods the proportion of the sexes was about equal.

Age of First Appearance of Asthma.—While the disease may begin at any period of life, our records show that no less than 51 per cent. of the cases began before age 20. At first sight this would suggest that asthma is very largely a disease of youth, but when further adjustments have been considered, it would seem as if the incidence of the disease varies but little at different periods of life.

Heredity.—It was found that some close relative had also suffered from asthma in the case of 38·7 per cent. of the patients examined. Urticaria and similar conditions were not inquired about, as it was thought that the patient's knowledge of these would be too incomplete to afford information of value. Of the 139 cases in whom inheritance was noted, 59·6 per cent. began to have asthma before the age of 20, but when the question is further looked into, it would again seem as if in each age-group the proportion of inheritance cases is about the same, and there is really no preponderance at any one period of life.

Incidents Associated with First Appearance of Asthma.—One of the most striking features of the inquiry has been the very large number of patients (80 per cent.) who were suffering from some respiratory infection just before the asthma started. Other concomitant conditions were rather infrequent in comparison—digestive disorder 7 per cent., nasal condition 12·6 per cent., psychic disturbance 4·6 per cent., skin disease 5·7 per cent.

Occupation.—No less than 75 separate occupations were mentioned by the patients in this series, but few of the groups were of any size. The largest were "household duties" 93, and school 66. Various types of outside work accounted for only 51 cases—a small fraction of the whole. In a certain number of cases, direct evidence was obtained of a relationship between the disease and the patient's occupation. This was particularly noticeable in the case of eight bakers who were sensitive to flour, and three assistants in chemical works sensitive to ipecacuanha and morphia.

Dust.—Exposure to dust was recognised as an aggravating factor by 48 per cent. of the cases. In addition to dust generally, many special kinds were mentioned by individuals. Of these the majority were the common household dusts—floor, carpet, bed, fire, &c., others were associated with various occupations.

Odours and Emanations.—These were less frequently admitted as irritants (20 per cent. of cases). The principal group under this heading was the emanation from various animals or their products (11·5 per cent.). Dusts and odours may act largely as non-specific irritants, but pollens are more usually regarded as specific. Some 13·5 per cent. of the cases got asthma on exposure to pollens, the most common offenders being grass or hay. It is interesting to note that 7·3 per cent. of the subjects suffered from hay-fever in addition to asthma.

Food Substances were complained of by 38 per cent. of the patients, and more than half of these incriminated potato (22·4 per cent.). It may be that the relationship of this article of diet to the occurrence of asthma is an indirect one, by the production of indigestion with a reflex stimulation of the bronchi, since protein skin tests seldom confirmed the patient's objection. Fish, eggs, cheese, and milk were the next largest groups, but each appears only about 10–15 times in the whole series.

Protein Skin Tests were tried out in about 300 patients, and 50 per cent. of these gave positive results. Reaction to one protein only was found in 10·8 per cent. of the cases investigated, the remainder were sensitive to more than one substance. "Multiple" test proteins were employed in a certain number of the subjects, and in these the milk and egg group gave most positives, then in order of frequency came the dandruffs, various meats and certain vegetables. Positive skin reactions were not found more often at any period of life, being distributed fairly evenly throughout the whole series.

Climate.—Asked regarding the relationship of climate to their asthma, 35 per cent. of the subjects replied that their attacks were quite independent of the weather. The others mentioned a large number of different weather conditions as harmful. Cold and damp (65 per cent.) appeared to be the most likely to bring on asthma, but a small number objected to dry or warm weather (18 per cent.). Winds were also complained of, particularly east wind which is often cold and moist in this district. A certain proportion of the patients found that their asthma was definitely seasonal, as, for example, those due to grass pollens. Many believed that their liability to the disease varied with the *season*. As might be expected, most asthmatics were worst in winter, but it was surprising to find that the figure for summer was not far short of the other. Spring and autumn were not often mentioned in this connexion. The value of these observations is probably modified by the fact that the limits of the seasons are not commonly appreciated and summer and winter may merely be employed as indicating good and bad weather. The same arrangement of the seasons was noted in relation to the first onset of asthma, the relative figures for this being winter 101, summer 90, autumn 63, spring 61.

Locality.—Compared with the figures for the general admissions to the hospital, the seaside villages on the shores of the Forth estuary supplied a greater proportion of asthmatics than the inland areas. Not many of the patients examined were able to give satisfactory information regarding the effect of a change of residence, but of those who had noticed its importance 19 per cent. claimed to be worst when at the seaside, 14 per cent. when in the country, and 11 per cent. when in town. A few individuals stated that they were definitely free from all trace of asthma when in certain places.

Psychic Disturbances, such as fright, worry, or emotion induced attacks of asthma in 40·6 per cent. of cases, while fatigue was only occasionally a contributory factor. *Exertion* appeared to be a common cause, but patients did not always clearly differentiate true spasmodic attacks from simple dyspnœa. Of 112 females of active *menstrual* age, 46 per cent. found their asthma worse at or just before the period. A large proportion of the cases claimed that their asthma was likely to trouble them only if they "caught cold," but figures for this are not available, as the relationship was not asked for definitely. On the other hand, *constipation* was not a factor of much importance except in a few instances.

Examination of the *nose*, *throat*, *&c.*, was carried out in 299 cases on first reporting at the hospital. Nasal abnormalities were present in 63·1 per cent. of the asthmatics examined. Enlarged inferior turbinals were found in 40·5 per cent., septal deviations and spurs in 30·7 per cent., polypi in 15·4 per cent., and accessory sinus trouble was noted in 7·2 per cent. of the subjects. The occurrence of skin lesions in this series has already been reported.[1]

Observations not discussed above suggest that many of the patients suffer from minor manifestations of the disease in addition to the typical dyspnœic attacks. One or two of the subjects have described a passing choking sensation of a few minutes' duration on exposure to an irritant, with a fully developed asthmatic spasm during the following night. If a latent interval of this sort is at all common, it might explain the difficulty that exists in so many cases of identifying the irritant.

The analysis of the case records has demonstrated the enormous importance of respiratory infections in the production of asthma in this district. It has shown that the tendency to develop the disease at different periods of life is more uniform than was previously supposed. Many points already known have been confirmed, and percentage figures are available to show the relative importance of various factors. Lastly, the investigation has disclosed many pitfalls, and has suggested precautions which must be observed in order to obtain information of value from such an inquiry.

It is hoped that a more detailed account of the investigation may be published later.

MEDICINE AND THE LAW.

Tenure of Office of Local Government Officials.

LAST week THE LANCET dealt with the decision in Brown *v.* Dagenham U.D.C., establishing the right of the urban council to dismiss at will and without notice its clerk—and inferentially its medical officer of health whose case is governed by the same enactments. Mr. Justice McCardie soon afterwards delivered a reserved judgment in Field *v.* Poplar Corporation, which dealt with the tenure of the office of a chief sanitary inspector in a metropolitan borough. It was a question of the power of the borough council to reduce an officer's salary without his consent. Mr. Field was senior sanitary inspector; he had had various increases of remuneration until 1925, when he was receiving the salary of £450 with the approval of the Minister of Health. In September, 1927, the council desired to effect a general reduction of salaries and notified Mr. Field of the course they were taking. In October they passed a resolution of which the effect was to cut his salary down to a basic figure of £308 plus a bonus varying with the cost-of-living figures, making his total salary for the time being £433 3*s.* 7*d.* He was given no notice of dismissal; he never consented to the reduction, and, though the council took the opinion of the Ministry, the Ministry gave a qualified approval in guarded terms "provided that the council give any notices and obtain any consents which may be legally necessary." Mr. Justice McCardie found great difficulty in unravelling the tangle of enactments governing the situation. He looked at Section 62 of the Metropolis Management Act, 1855, which gave boards of works and vestries the power to appoint officers, to remove them at their pleasure, and to pay them such salaries as they might think fit. Here, so far, the local authority could dismiss officers and alter salaries apparently at will. Then came Sections 1 and 4 of the London Government Act, 1899, which gave the defendant council the powers of a local authority under Section 62 of the 1855 Act. Next came Section 108 of the Public Health (London) Act, 1891, which gave the Local Government Board (now the Ministry of Health) the same powers as they possessed in the case of the district medical officer of a poor-law union in regard to his qualifications, salary, and tenure of office; medical officers of health were to be removable under this section with the consent of the Local Government Board, or by that Board, and not otherwise; and such medical officers were not to be appointed for a limited time only. Sections 106 and 108 of the 1891 Act authorise the Board to make regulations, and one such regulation declared that every sanitary inspector should continue to hold office "for such period as the sanitary authority may, subject to our approval, determine at the time of his appointment," or till he died or resigned, or was removed, or became insane—the last of these contingencies being in the learned judge's opinion by no means impossible if the inspector risked the strain of studying his legal position. "I confess that, if any sanitary inspector spent much time in seeking to unravel the appalling intricacies of Acts and regulations which deal with his duties, status, and rights, he might well develop ere long some obvious symptoms of mental instability." Another regulation enacted that the sanitary authority should pay its officers such salary as the Local Government Board approved. Finally, Section 7 of the Public Health (Officers) Act, 1921, applied Section 108 (2) (*b*) and (*c*) of the 1891 Act to chief or senior sanitary inspectors, thus making these officers removable only by the sanitary authority with the Ministry's consent and not otherwise and making all future appointments unlimited in time. The result of this long sequence of enactments was that Mr. Field could not have his salary reduced unless the Ministry approved; the Ministry had approved in a cautious formula which made Mr. Field's consent a condition precedent. Mr. Field had never consented to the reduction, and therefore the action of the Poplar Corporation was *ultra vires*. There was a possible difficulty in the case, on the point of consent, in that the National Association of Local Government Officers ("Nalgo") might, by its approval of the reduced salaries, have committed Mr. Field to be a consenting party. He had used the services of "Nalgo" in 1920 when they secured a rise in salaries, but the judge held that Mr. Field was not bound by "Nalgo's" acceptance of the reduced scale; Mr. Field had himself voted against the acceptance of the reduction, and the Sanitary Inspectors' Association (of which he was also a member) had protested against it. The language of Mr. Justice McCardie, in summing up the law, deserves the attention of Parliament. "I hope," he said, "the time is not far distant when our local government law will pass from the evils of an almost chaotic obscurity into the region of a lucid and orderly arrangement." When the present proposals for local government reform are passed into law the position will be far more intricate and obscure; it is essential that Parliament should then restate the law in a comprehensive and comprehensible form. At present it has to be extricated from a tangle of statutes and regulations going back for more than half a century and involving references to both local and central authorities long since superseded.

[1] Low, R. Cranston: Brit. Jour. Derm. and Syph., 1928, xl., 389.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Opium Habit.

IT is not only the anti-narcotic zealots who keep a jealous eye on the consumption of opium in India and elsewhere. The question is now being treated as one of practical world import, and the latest evidence of this is that the League of Nations has decided to conduct an inquiry into the use of opium in the Far East. Whether much fresh evidence is likely to come to light is a matter of opinion, but it has to be remembered that numerous investigations have previously taken place, and Lieut.-Colonel R. M. Chopra, of the Calcutta School of Tropical Medicine and Hygiene, has recently conducted a very extensive inquiry into the present position of the opium habit in India. One conclusion at which he arrives is that the opium habit is not nearly so common as might be imagined from some recent publications. There are, he says, areas in every province where the consumption is high, and these areas are being carefully investigated by the local governments concerned, with a view to determining the causes which have led to excessive use of the drug, and possible means of eradicating them. It is stated that the habit is on the whole decreasing, and that the rate of decrease has been much more rapid during the past fifteen years than previously. There are various causes which dispose certain communities to the excessive consumption of opium, and it is noted that one of the most important is the influence of the prevailing religion. Thus, the habit is much more general amongst the Sikhs than in a Mohammedan population, owing to the prohibition of narcotics in the Koran.

The medical profession, which is presumably in the best position to form an unbiased opinion, has usually taken up a moderate attitude on this question, as on the allied one of alcohol. Apart from the purely medical use of opium, in the East at all events, it may be said to have an almost harmless "dietetic," as well as a very pernicious narcotic aspect. In certain agricultural regions it may be said to take the place of a moderate ration of alcohol, and to fulfil a useful stimulant function in the absence of food. In this way it has proved a boon not only to coolies working in the tea gardens and ricefields, but to more enlightened people who have had the self-restraint to use it with discretion. There is also the further consideration that it is so easily obtained, by the cut of a knife on a half ripe poppy capsule, that a rigorous policy of restriction is likely to drive production into underground channels, as has recently occurred in the case of the Bhils of Central India with regard to alcohol; and here as elsewhere it would seem desirable for a policy of education to precede anything approaching total prohibition. While admitting, however, that opium may have reasonable uses, apart from its place in the pharmacopœia, it is well to remember that there is another side of the picture. For its employment in the form of smoking no one can have a word to say, and the custom of administering the drug to infants, for the mere purpose of keeping them quiet, is extremely deleterious. This is one direction in which maternity and child welfare centres are probably having a good effect in localities where they are established. As with alcohol, while admitting that it has its uses, one may question whether the world would not be better off on balance without the juice of the poppy; but in the meantime it would be interesting, as the *Pioneer* observes, to know how far the diminished consumption which is recorded in recent years is being accompanied by the use of cocaine and other preparations far more harmful, which are being smuggled into the country from various parts of the world where they are manufactured.

Euthanasia for the Hindu.

Mr. Gandhi, who at all times has the courage of his convictions, has recently taken a step which is reported to have given rise to great resentment in Ahmedabad, near which city his *ashram* is situated. He has sanctioned the killing of an ailing calf, and in reply to a remonstrance from some of his co-religionists, has expressed the view that to kill an animal which is in great suffering and past all hope of recovery is a religious act. To apply the same principle to humanity, in similar circumstances, is also in his view justifiable. He argues that the idea that mere killing is essentially sinful is erroneous, and that when an animal, or even a man, is in extreme suffering, and there is no prospect of a cure, it is a meritorious action to put an end to life. "I do not feel sorry for what I have done" he says, in reply to censures, "and I think that what applies to a calf must apply to our relatives also." This pronouncement is regarded by most orthodox Hindus as a blow at the very foundations of their religion, and coming from a person with his reputation as a religious leader is a very remarkable sign of the times. One is used to the periodical recurrence of this question of euthanasia in European countries, and also in the United States of America, but to have it brought forward by a Hindu ascetic is something new. Certainly in India the conditions under which hopelessly diseased domestic animals and human derelicts of the lowest classes live must often give rise to thought in this connexion, and even in better surroundings the spectacle of a microcephalic idiot, for example, being artificially fed, in order to preserve a life which would automatically flicker out if left to nature, may well occasion questionings whether in the East or the West. The fact remains, however, that the doctrine of happy dispatch has so far hardly raised its head amongst the Hindus, though suicide is common enough, and it would be curious if a revival of this question, on a practical basis, should have its source in India.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Physical Welfare in the Scottish Universities.

SOME years ago Dr. Tait Mackenzie gave a striking lecture in Edinburgh on his functions as professor of physical education at Pennsylvania University. It was evident that he had developed a system that covered every phase of physical welfare, but which was based primarily on a careful medical examination of the fitness of every student. It was not merely a system of physical education; it was a system for the medical superintendence of growing lads faced with a heavy curriculum. Each student individually had his ration, as it were, of physical exercise carefully prescribed and adapted to his condition. At the lower end of the scale there were men that needed remedial gymnastics; at the upper end of the scale the men were selected for the highest and heaviest games. In a population of some 10,000 students the work of medical professor of physical education was bound to be considerable.

There was a general feeling in Prof. Tait Mackenzie's audience that something of the same systematic kind was required for the Scottish universities. The athletic clubs cover only a small part of the ground and the idea behind the clubs is rather an ideal of competitive excellence in games than of general physical welfare. But matters have since then advanced considerably in the Scottish universities. The University Courts of both Glsagow and Edinburgh have approved of an ordinance increasing the matriculation fee from £2 2*s*. to £2 12*s*. 6*d*. The additional half-guinea is to be set aside as a special fund for the promotion, directly or indirectly, of the physical welfare of students of the University. It is expected that this increase in the fee will take effect as from Oct. 1st next. At the discussion on the ordinance at Glasgow it was clearly indicated that all parts of physical welfare should hang together and, although this additional sum was to be earmarked for physical welfare, the problem of the

Students' Union and related institutions was not being ignored. It is to be hoped that all the Scottish universities will take the proposed view of the health of all the students, both men and women. The curricula in arts, medicine and science are extraordinarily exacting on the physique.

The Milk Problem.

Addressing the students of the West of Scotland Agricultural College, Dr. J. B. Orr, director of the Rowett Research Institute, recently said that if the national importance of milk was appreciated, there would be little difficulty in getting a pure supply. Money spent on an increased use of milk, which would bring the rising generation better health and sounder constitutions, would give a better return to the nation than ten times the same amount of money spent in trying to cure disease. The proper way to deal with the danger of tuberculosis was not to discourage the use of milk but to eliminate the infection. Though this could be done by heating the milk under proper conditions, heating detracted somewhat from its health value, and pasteurised or boiled milk was only a second best. Tuberculosis ought to be eliminated in the cow, and this could only be accomplished by a strong national campaign by the public health authorities.

Some 40 blind women were transferred on Feb. 13th from the Institution at West Craigmillar, Edinburgh, where the accommodation has proved inadequate, to the new home which has been built for them at Alfred-place. The new home, which is believed to be one of the first of its kind and which is to be known as the Thomas Burns Home for Blind Women, is pleasantly situated, and has accommodation for about 80. All the workrooms, dining-rooms, and bedrooms have been constructed and fitted with a view to providing healthy and comfortable surroundings for the women. Wireless listening apparatus is provided next to each bed. The total cost of the building will be between £16,000 and £17,000, of which all but £2500 has already been subscribed.

At a recent meeting of the Glasgow University Court Sir Donald MacAlister, the Principal, commented on the large number of applications from home and overseas which were being received for enrolment in the first year classes in medicine. Of the total received, 79 were from Americans. It was mentioned that normally there was accommodation for 180 students, and the suggestion was made that the limit of enrolment might be fixed at 200.

The late Sir Alexander Ogston expressed the wish that his collection of weapons, arms and curios should be offered on his death to the University of Aberdeen. The collection has been accepted for the Anthropological Museum.

At a meeting of the Society of Antiquaries of Scotland, Prof. Alexander Low related the discovery of a skeleton in a sand pit at Culduthel, Inverness, and Prof. T. H. Bryce reported on two discovered during the excavations at Skara Brae, Orkney, in 1928. Both the Orkney skeletons were those of women, one elderly and one well advanced in middle life, who had suffered severely in life from osteo-arthritis, especially affecting the vertebral column. The leg bones show peculiarities of structure which indicate habitual adoption from early life of the squatting posture.

HOSPITAL CLAIMS FOR ACCIDENT TREATMENT.—At Salop Assizes last week, Mr. Justice Roche tried a claim for damages in a motor accident, in which one of the plaintiffs recovered £1500 and the other £200. Remarking that the man who was awarded the larger sum had received "hundreds and hundreds of pounds' worth of treatment" in the Royal Salop Infirmary, the Judge pointed out that where hospital rules were properly framed expenditure in such cases could be recovered.

Correspondence.

"Audi alteram partem."

ARTHRITIC MUSCULAR ATROPHY.

To the Editor of THE LANCET.

SIR,—In Dr. Beryl Harding's interesting paper on the cause of arthritic muscular atrophy in your number of March 2nd, two forms of atrophy are recognised: one from disuse—e.g., after nerve section—the other from an unexplained reflex. The cause of atrophy which follows upon section of a nerve is obvious, but Dr. Harding points out that the reflex mechanism underlying the atrophy of arthritis is still obscure.

The physiological consequence of an arthritic knee-joint is a flexor reflex affecting the entire extremity. This is due to continuous stimulation of nociceptive endings within the joint, which, in man as well as in animals, tends to evoke reflex withdrawal of the limb. Such a response, owing to reciprocal innervation, is accompanied by *reflex inhibition* of extensor muscles (e.g., quadriceps). One of the striking features of many cases of arthritis of the lower extremities in man is the semi-flexed posture of the knee. This, I take it, is associated with a constant reflex inhibition of the extensor muscles. I believe, therefore, that atrophy of the extensor muscles seen in cases of arthritis is also an atrophy of disuse brought about by reflex inhibition.

If this interpretation holds, it would follow that flexor muscles would show less atrophy than the extensors. I should appreciate it if clinical observers would inform me whether this is in harmony with their experience.

I am, Sir, yours faithfully,

J. F. FULTON.

The Laboratory of Physiology, Oxford, March 2nd, 1929.

To the Editor of THE LANCET.

SIR,—In my presidential address to the Orthopædic Section of the Royal Society of Medicine on Oct. 6th, 1925, I put forward the view that two physiological factors are responsible for the muscular wasting associated with arthritis: "One, a reflex inhibition of the postural or tonic activity of the muscle, about which there is no doubt whatever, and the other, a reflex excitation of the phasic activity of the same muscle, or, in other words, an attempt at reflex protective spasm." The investigations of Dr. Beryl Harding, published in your last issue, appear to confirm this view in so far as she has shown that the muscular atrophy induced by experimental arthritis is associated with an increase of the reflex (phasic) activity of the affected muscles. But the observation that such increased activity occurs in spastic muscles without any diminution in size of the muscles shows that a second factor is necessary to account for atrophy. Lippmann and Selig, quoted by Dr. Harding, have observed that "the atrophy which follows experimental arthritis is preceded by muscular relaxation—muscle collapse—and the subsequent course is the same as that which obtains following tenotomy and nerve section." From this they infer that arthritic atrophy is a disuse atrophy and "is caused by a reflex mechanism." They appear to have missed the significance of the muscular relaxation which precedes arthritic atrophy. It is, of course, the clinical evidence of the reflex inhibition of the postural or tonic activity of the muscle, which I have suggested, is one of the factors responsible for this type of atrophy. As I pointed out in my address, "postural activity alone is able to maintain a state of tension for long periods with hardly any increase of metabolism, as in maintaining ordinary postures. With the help of postural activity a mild phasic activity also can be maintained very economically, as in the condition of

decerebrate rigidity. But without the support of postural action prolonged phasic activity is a most extravagant form of energy and it leads to a rapid using-up of the materials from which the energy is derived." I am, Sir, yours faithfully,

A. S. BLUNDELL BANKART.

London, W., March 4th, 1929.

TUMOURS OF THE SPINAL CORD.

To the Editor of THE LANCET.

SIR,—Dr. J. G. Greenfield asks why I applied "such a meaningless term as 'gliosarcoma'" to a tumour in a report which Dr. Theodore Thompson included in his article on the Diagnosis of Lepto-meningeoma of the Spinal Cord. From the histological evidence, which I attempted to describe, I concluded that the tumour was not a neurinoma, but was composed of neuroglial cells and fibrils—that it "consists of atypical neuroglia." Accepting the atypical nature to be histological evidence of malignancy I proceeded to call the tumour a "gliosarcoma in the less restricted sense of this term"; in its more restricted sense "gliosarcoma" has been applied by some to particular glial tumours of the brain. Surely no term is meaningless when it has been immediately preceded by a definition. I am, Sir, yours faithfully,

HUBERT M. TURNBULL.

Bernhard Baron Institute of Pathology, London Hospital, March 4th, 1929.

THE INJECTION TREATMENT OF VARICOSE VEINS.

To the Editor of THE LANCET.

SIR,—As one who has studied with interest the injection treatment of hæmorrhoids and varicose veins, will you permit me to comment on the letter of Prof. Archibald Young which appeared in your issue of March 2nd? Your correspondent takes up an attitude of Jove-like superiority and rebukes the medical profession of the whole world for adopting methods which have given ample evidence of practical success.

His first argument against the methods is that they are simple, and one gleans the impression that because of their simplicity they are condemned. This simplicity, which, to the ordinary person would appear an advantage, becomes, in the eyes of the critic, a danger. Mr. Young does not state whether, if the method were complicated, he would be more inclined to approve of it, but I feel that the pen of a Samuel Butler would be required to do justice to such a state of mind.

The next objection—namely, that there is no proof that "the method is as effective as operation in cases that really require treatment"—leads one to suppose that Prof. Young cannot yet have seen a completed case. One had begun to hope that the thousands of cases which have been successfully treated in Great Britain and on the continent would have finally laid the bogies of embolism and thrombosis; but they are again raised in this letter without a shred of evidence being called in their support. If the injections are properly given—that is to say, if the solution is introduced into the blood stream and not into the wall of, or outside, the vein—there is no possibility of sloughing arising; and therefore it seems that the cases which Prof. Young has seen have been badly treated. By his remark that he has no inclination to take part in any correspondence that may emerge he puts himself in the position of the small boy who rings the front door bell and then runs down the street; but as much for the sake of neurologists as for the practitioners of injection methods he ought to explain by what process of cerebration he is able to look at a vein for the first time after it has been successfully treated, and say that that vein was never in a condition to be treated. His words are: "... the injection treatment had been carried out upon veins that called for no such active procedure at all." Unless a model of the leg was made before the first injection was given and a detailed note of the patient's symptoms was taken, his claim to reconstitute the size, anatomy, and symptoms of a thrombosed vein endows him with a power of revisualisation which, if extensible, will strike fear into the hearts of others besides the humble practitioners of a simple art.

Finally, no man, however pontifical his mental outlook, should condemn a treatment without advancing arguments. Your correspondent in question vents at length his disapproval of the injection of varicose veins, but disapproval is not scientific argument. One expected that the chief thunderbolt of his wrath would be hurled at the treatment of hæmorrhoids by injection—but the thunderbolt turns out to be only a poor squib, for, just as one cannot multiply nothing, so the threat of "arguments perhaps even more potent" is not likely to frighten those who honestly believe that they are practising a successful, if comparatively unimportant, branch of the healing art. I am, Sir, yours faithfully,

CHRISTOPHER HOWARD.

Sloane-street, S.W., March 1st, 1929.

To the Editor of THE LANCET.

SIR,—Prof. Young says that he "profoundly disbelieves" in the injection treatment of varicose veins, and will not admit that the method is as effective as "operation" (by which I presume he means excision) "in cases that really require treatment." Since May, 1925, I have been continually practising the injection method and have been amazed at the very large proportion of cases that have come to be cured after having undergone the operation of excision once, twice, and even three times; this, however, only confirms the popular feeling that excision is frequently not a permanent cure. I wonder whether the following letter from a patient would be considered proof that the results of injection can be better than those of "operation." It was written in 1926:—

"During my army service I found long marches or standing caused me acute discomfort and it became evident my slightly varicose veins were becoming worse. After standing for some time the thighs felt full as if the skin had become several sizes too small and at night the veins would throb and bubble (like hot-water pipes) so that the relaxed muscles would shake like a jelly—making sleep impossible.

"In October, 1917, both thighs and calves were operated upon. I was four hours on the operating table and had a very uncomfortable ten days till the stitches were removed. Was in hospital seven weeks and it was a further three months before I was fit again. Within eight months the veins began to trouble me again, and in 12 months were worse than before the operation. After demobilisation by wearing elastic stockings and leading a sedentary life I could carry on, but sports were out of the question, as standing for five minutes brought on the "over full" feeling in spite of elastic supports.

"And now to the present time—within a few days of the injections into the thigh veins the 'full feeling' became a mere memory, and now my cure is nearly complete I am looking forward to taking up various sports I had to forego. Even during the treatment I have tested my legs severely on several occasions, including a long day at the motor show (a thing ridiculous to contemplate before even with elastics) without any discomfort whatever. Believe me it is very enjoyable to be out of the semi-invalid class once more. From all points on which I can speak there is no comparison at all between the operation treatment and yours as the injections cause only slight pain, slight discomfort for a short period, and give immediate results.

"I am so enthusiastic about the treatment that I am bringing it to the notice of everybody I can as I feel it cannot be too widely known."

Prof. Young seems to think that a large number of cases of varicose veins do not require treatment, and certainly one would refrain from suggesting to them that they should undergo excision with all its attendant dangers, discomfort, expense, and loss of time in hospital or nursing home. But when a patient seeks

advice, it is because he wants relief from all the pain, weariness, and discomfort he experiences—and these symptoms are often out of all proportion to the actual size of the varicosities—and this relief can be safely and expeditiously given without loss of time or interference with his business engagements, which alone is an economic factor of the greatest importance. I fail to see why Prof. Young should be so contemptuous of the facility with which this method can deal with very minor cases amongst "quite young girls" who are naturally anxious to be relieved of the disfigurement and more especially of the great possibility of gradual increase and extension of the varicosity complained of. I say they cannot be treated too soon.

I am sure that the drawbacks of the method can be eliminated by careful attention to all points of the technique involved. The fact remains that this method of treatment has been hailed by the public, as well as a very large proportion of the medical profession, as a very great boon and justifies itself by the speedy and complete cures obtained, and by great appreciation and gratitude evinced by those who have availed themselves of it.

I am, Sir, yours faithfully,

SIDNEY ALEXANDER.

Welbeck-street, W., March 4th, 1929.

OPERATING FOR APPENDICITIS

To the Editor of THE LANCET.

SIR,—In his Hunterian lecture Mr. Love raises again the question of immediate operation *versus* "delayed treatment" in cases of appendicitis in which the infection is limited to the right iliac fossa, and in support of his decision in favour of "delayed treatment" he cites statistics of cases at the London Hospital over a number of years. Now statistics are notoriously fallacious, and an obvious criticism of these is that no mention is made in them of the number of late cases in which the appendicitis was definitely settling down at the time when they were first seen. I do not think that any surgeon would recommend immediate operation in a case in which the temperature and pulse had fallen to normal and the mass in the iliac fossa was known to be subsiding, and if such cases were included in the group treated by the expectant method, naturally the proportion of successes by this method would be disproportionately raised.

It is in the treatment of those cases seen about the fourth or fifth day in which signs of active, though localised, peritonitis are present that I wish to join issue with Mr. Love. If I understand him correctly, he lays it down as a rule that these cases should be treated expectantly on the ground that operation at this stage is apt to spread the infection. I do not believe this risk is more than infinitesimal if the operation is properly carried out and the following rules are strictly observed:—

(*a*) The peritoneal cavity must be carefully and completely packed off with gauze before the infected area is touched.

(*b*) At no period of the operation must any portion of the gut be allowed to project above the level of the wound during the search for and removal of the appendix, and for this reason no attempt should be made to embed the stump of the appendix.

(*c*) The search for the appendix should be discontinued if it is not easily found, and if the appendix cannot be separated from its surroundings without greatly disturbing their relations, it should be left in situ.

(*d*) Drainage should be confined to the infected area. Why drain the pelvis for an infection limited to the iliac fossa? The insertion of a drain into the pouch of Douglas in such a case can only tend to soil a fresh field of peritoneum.

I cannot help feeling that if Mr. Love's advice is extensively followed and these doubtful cases are left to delayed treatment as a general rule we shall see a rise in the incidence of general peritonitis and of sequelæ, such as subdiaphragmatic abscess, which are now, happily, almost extinct. The lowering of the mortality from appendicitis will be more likely to be brought about by the observance of a more perfect technique in the approach to the inflamed appendix than by allowing Nature, in her leisurely and uncertain way, to dispose of inflammatory products which are a menace so long as they have no safe channel of escape.

I am, Sir, yours faithfully,

R. DAVIES-COLLEY.

Devonshire-place, W., Feb. 26th, 1929.

To the Editor of THE LANCET.

SIR,—There are three points in Mr. Love's lecture which seem to me to call for comment:—

1. The leucocyte count.—Mr. Love finds that "there is no marked rise in the total number of leucocytes until after the fifth day." My experience has been that a leucocytosis of 12,000 to 15,000 is commonly found as early as the second or third day.

2. The treatment of "those cases in which inflammation is limited to the right iliac fossa, and which present themselves from the second day of the disease onwards, as a localised peritonitis or a circumscribed abscess."—Mr. Love points out the high operative mortality in these cases and rightly condemns the routine removal of the appendix when operating on the abscess. This high death-rate is chiefly due, not to the opening of the abscess, but to the removal at all costs of the, often adherent, appendix.

3. The criticisms of delayed treatment.—Non-operative treatment (admittedly advisable under certain special conditions) is, as stated by the late John B. Murphy, "not so much a matter of choice, but a matter of necessity." Mr. Love's criticisms omit the special disadvantage of delayed treatment which lies in the fact that it provides no means of confirming or disproving the diagnosis of appendicitis.

No one is infallible, and since the introduction of delayed, non-operative, treatment, there must have occurred a number of cases in which an incipient peritonitis, due to the escaping contents of a perforated viscus, other than the appendix, has been diagnosed as appendicitis and treated by delayed treatment with results which have been disastrous.

I am, Sir, yours faithfully,

C. HAMILTON WHITEFORD.

Plymouth, Feb. 24th, 1929.

THE SEBORRHŒIC STATE.

To the Editor of THE LANCET.

SIR,—In the annotation which you kindly devoted on Feb. 23rd (p. 404) to my first Lettsomian lecture, there are one or two points on which my views are not quite correctly presented. I did not intend to infer that "relatively little work has been done on the bacteriology of the epidermis"; on the contrary, an enormous amount has been done during the last 25 years, and our knowledge of the subject is fairly complete. The cholesterol fats to which I referred are the chief constituents of the *sebaceous*, not the sweat glands—the amount of fat secreted by the latter is very small. With regard to the "astonishing number of adjuvant organisms" in the common infective lesions of the skin, my own experience is that these lesions are, as a rule, remarkably pure, although the number of actively growing organisms of the given species, even in a trivial lesion, is enormous. Thus the acne comedo and pustule are pure acne bacillus infections, and from most staphylococcal lesions some strain of staphylococcus is usually to be obtained in pure culture. I need hardly call attention to the obvious misprint, scabrous for *glabrous*, in the second paragraph.

I am, Sir, yours faithfully,

H. W. BARBER.

Devonshire-place, W., Feb. 25th, 1929.

THE PREVENTION OF INFLUENZA.

To the Editor of THE LANCET.

SIR,—Last week you gave a useful résumé of how best to avoid and deal with attacks of this infectious disease now prevalent. One pitfall which might have been mentioned has lately been fully discussed by Dr. Lachlan Grant—namely, the danger of washing in "stationary" water in the ordinary wash-hand and lavatory basins. As these basins are used by everybody, healthy or unhealthy, and cannot be sterilised after use, they are bound to harbour infective micro-organisms and thus favour a spread of infectious diseases. Dr. Grant's remedy is to fit all such basins with a raised tap, having a rose wave or jet outlet, removed some distance from the sides of the basin so as to prevent the hands coming into contact with its contaminated walls. By this device ablutions are performed in pure fresh water, all infective particles being conveyed direct to the soil pipe. I am, Sir, yours faithfully,

RITA C. WEIR, M.B. Glasg.

Bacteriological Laboratory, Ballachulish, Argyleshire, March 3rd, 1929.

AGRANULOCYTIC ANGINA.

To the Editor of THE LANCET.

SIR,—Dr. Batten's report of a case in your last issue (p. 440) draws attention to a condition which, if not actually so infrequent as some think, is at least very seldom diagnosed. He suggests that further work should be done with regard to arriving at the ætiology of the condition and to finding some method of treating it.

In Germany some good results have been obtained by the application of X rays (in mild doses) to the long bones with a view to stimulating the output of leucocytes. A few cases were treated thus with success in Berlin in the summer of 1927. I saw two cases of agranulocytic angina treated in this way by Eppinger, of Freiburg; one was a nurse, but she was almost moribund before the treatment was tried and died shortly afterwards; the other, a woman of 42, made quite a remarkable recovery, although her white count was very low before the institution of the treatment (800 per c.mm.) Eppinger showed this case later at a meeting of the Freiburg Medizinische Gesellschaft. I am, Sir, yours faithfully,

Cricklewood, March 5th, 1929. P. J. MOLLOY.

THOUGHTFUL GRATITUDE.

To the Editor of THE LANCET.

SIR,—When a medical man who is in ill-health asks for the advice of a consultant and obtains it without any fee, how well it would be if it were an understood rule that he should send a cheque, according to his circumstances, to one of the medical charities, such as the Royal Medical Benevolent Fund or the British Medical Benevolent Society. A little more thoughtful gratitude on the part of the profession would vastly increase the well-known usefulness of those institutions.

I am, Sir, yours faithfully,

JAMES G. MACASKIE, L.R.C.P. & S. Edin.

Princes-square, W., March 4th, 1929.

*** The hon. treasurer of the Royal Medical Benevolent Fund is making a special appeal for financial help to the Fund at this time of year when poverty is made the harder to bear owing to illness and bodily suffering. Subscriptions are urgently needed to enable the committee to meet many calls which are made by members of our own profession, their widows and dependents, who are afflicted by poverty and want. Some have no friend or relation to whom they can turn and are dependent on this Fund alone. A number of cases which were relieved at the last meeting are described on p. 534. Subscriptions and donations may be sent to him at 11, Chandos-street, London, W.1.—ED. L.

Public Health Services.

INFLUENZA.

CLINICAL reports indicate that the epidemic is still very widespread, although in most places remaining mild in form. Numerous cases of pneumonia are occurring in Leeds, but there is some doubt whether the majority of these are secondary to influenza or primary. Sheffield reports a widespread but mild epidemic of influenza, and in Leicester town and county a severe type of the disease is reported and a rather severe type also in Northamptonshire. Reports from Birmingham and North Staffordshire suggest that the disease is on the increase and the epidemic does not appear yet to have reached its peak in the Midlands generally. The disease is still very prevalent in Manchester and other Lancashire towns, as well as in Newcastle-on-Tyne and the North, but in Liverpool it is decreasing rapidly. The Eastern counties are also affected. A mild form of the disease is reported from South Wales, while North Wales and Gloucester are stated to be free. In Scotland, during the week ended March 2nd, the aggregate death-rate for the 16 towns was 19·1, that for Aberdeen being 30·2, Glasgow 17·8, Edinburgh 21·4, and Dundee 19·9. Deaths from influenza and respiratory diseases numbered 67 and 213 respectively and 298 cases of pneumonia were notified.

On the Continent a marked increase in the number of deaths occurred in the Rhine districts as far south as Mannheim, which had so far been unaffected by the epidemic. Thus the death-rate of Mannheim rose in a single week from 11·5 to 23·2 per 1000 inhabitants, that of Dortmund from 14·2 to 21·0. In the Netherlands the epidemic is causing some difficulty in the public services. The town most severely affected is Arnhem, near the German frontier, where the death-rate rose to 43·9 per 1000 during the week ended Feb. 22nd. In Paris during the first ten days of February influenza deaths were numerous, the general death-rate rising to 28·7; there was a similar increase at Lille, and the epidemic extended as far south as Lyons, where a death-rate of 32·6 was registered during the week ended Feb. 20th. The Italian Health Service reports a spread of influenza, particularly in the provinces of Northern and Central Italy. The prevailing type remains mild and complications are rare. An increased mortality has been observed as far east as Budapest, but Warsaw has as yet not been affected. The epidemic is generally abating in the Scandinavian countries. In Spain the reports of Feb. 18th show an all-round decrease. Switzerland has had the disease only in mild form; up to Feb. 9th the general mortality was very low for the season of the year. In parts of Czecho-Slovakia influenza is increasing. The epidemic in the United States of America is now virtually at an end.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 23RD, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 275; scarlet fever, 2150; diphtheria, 1098; enteric fever, 30; pneumonia, 4451 (last week 3658); puerperal fever, 43; puerperal pyrexia, 150; cerebro-spinal fever, 16; acute poliomyelitis, 4; encephalitis lethargica, 21; dysentery, 9; ophthalmia neonatorum, 83. No case of cholera, plague, or typhus fever was notified during the week.

Notifications of pneumonia have again risen considerably after a drop last week, the figures for the last six weeks being 1936, 1864, 2422, 3511, 3898, and 3658 respectively. Counties reporting a large number of cases of pneumonia are as follows: London 554 (last week 562); Chester, 155 (173); Derby, 53 (64); Devon, 47 (38); Durham, 244 (168); Essex, 128 (167); Kent, 92 (74); Lancaster, 783 (906); Leicester, 52 (42); Middlesex, 189 (150); Northumberland, 167 (100); Stafford, 209 (113); Surrey, 78 (69); Warwick,

313 (131); Yorks West Riding, 597 (296); from which it will be seen that the north is largely responsible for the increase.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Feb. 26th–27th, was as follows: Small-pox (46 under treatment, 1 under observation); scarlet fever, 1745; diphtheria, 1996; enteric fever, 10; measles, 64; whooping-cough, 1005; puerperal fever, 17 (plus 7 babies); encephalitis lethargica, 80; poliomyelitis, 7; "other diseases," 65. At St. Margaret's Hospital there were 8 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (0) from enteric fever, 88 (1) from measles, 12 (4) from scarlet fever, 249 (80) from whooping-cough, 54 (6) from diphtheria, 66 (13) from diarrhœa and enteritis under two years, and 1764 (473) from influenza. The figures in parentheses are those for London itself.

The number of deaths from influenza during the previous eight weeks was 83, 99, 122, 179, 321, 652, 987, and 1243 respectively, the figures for London during the same period being 15, 18, 34, 39, 77, 198, 331, and 393, from which it is seen that the rise has again become somewhat steeper. In the week under review deaths were attributed to influenza: Leeds, 136; Manchester, 95; Birmingham, 80; Oldham, 57; Bolton, 52; Hull, 46; Leicester, 38; Stoke-on-Trent, 37; Stafford, 34; Liverpool, 33; West Ham, 29; Croydon, 28; Norwich, 26; Reading, 21; and 26 other great towns with 10 or more. (Glasgow reported only 28, Edinburgh 27, Dublin 34, and Belfast 20.) The figures for the week ended Feb. 23rd, to complete the Registrar-General's comparative table of influenza death-rates (printed last week), are as follows: aggregate, 4·67; North, 5·19; Midlands, 3·84; South, 3·52; Wales, 1·20; Greater London, 5·35. Birmingham reported 13 deaths from measles, Liverpool 12, Sunderland 9, St. Helens and Cardiff 7 each, and Gateshead 6. The deaths from whooping-cough are widely distributed, the highest figures coming from Manchester, 23; Bolton, 14; West Ham and Oldham, 9 each. Liverpool reported 10 deaths from diarrhœa, Salford 6, Manchester 5.

The statement of deaths from small-pox for the month of January for areas outside the county boroughs and great towns included 4 deaths assigned to Durham, Jarrow (M.B.), Lancaster, Mossley (M.B.), Monmouth, Tredegar (U.D.), Flint, St. Asaph (R.D.).

The number of stillbirths registered during the week was 326, corresponding to a rate of 46 per 1000 births, including 67 in London.

Deaths in London during the Recent Severe Weather.

The Registrar-General also gives an instructive table showing the great increase in the number of

Week ended—	Influenza.		Respiratory diseases.		Heart and circulatory diseases.	
	All Ages.	Age 65 years and upwards.	All Ages.	Age 65 years and upwards.	All Ages.	Age 65 years and upwards.
Jan. 5th, 1929	18	4	273	124	353	225
,, 12th ,,	24	14	335	171	428	285
,, 19th ,,	39	12	372	189	489	324
,, 26th ,,	77	37	416	200	468	326
Feb. 2nd ,,	198	88	535	252	536	385
,, 9th ,,	331	146	678	311	632	446
,, 16th ,,	393	178	721	360	607	439
,, 23rd ,,	473	231	1,001	463	678	451

deaths, especially among old people, from influenza and from respiratory and circulatory diseases, in London during the recent severe weather. He remarks that the statement may probably be regarded as indicative of similar increase in the country generally.

RADIUM AT BRADFORD.—The annual report of Bradford Royal Infirmary states that a radium therapy department is being created, and it is expected that it will be in working order a few weeks hence. An appeal for £20,000 to equip the clinic and provide an adequate supply of radium has, so far, produced a little over £5,000. The average cost of each occupied bed was about £143. A Charter of Incorporation is to be applied for.

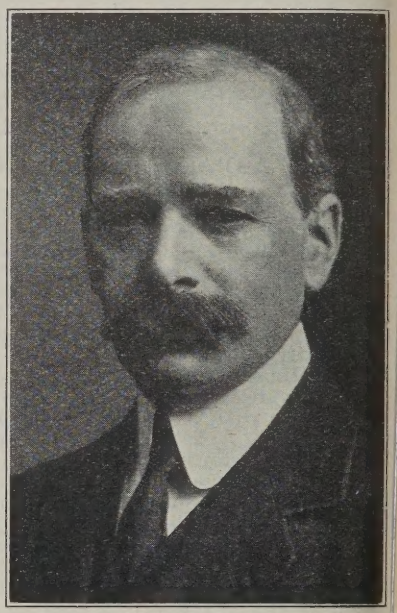
Obituary.

SIR HECTOR MACKENZIE, M.D. CAMB., F.R.C.P. LOND.,

CONSULTING PHYSICIAN, ST. THOMAS'S AND BROMPTON HOSPITALS.

WE much regret to announce the death of Sir Hector Mackenzie, which occurred at his residence in Upper Brook-street after a short illness on March 2nd in the seventy-third year of his age.

Hector William Gavin Mackenzie was born in Edinburgh in 1856, the son of Mr. J. Urquhart Mackenzie of that city. He was educated at the University of Edinburgh, where he graduated with honours, and Emmanuel College, Cambridge, where he was a foundation scholar. In 1880 he was Fifth Wrangler in the mathematical tripos, and was duly elected Fellow of his college. By this time he had decided to become a medical man, and joining the school of St. Thomas's Hospital he obtained the diploma of M.R.C.S., and graduated in medicine at Cambridge in 1884, when he also took the diploma of M.R.C.P. He proceeded to the M.D. in 1888, and having held the usual minor posts in the hospital was elected resident physician and medical registrar. He was at the same time assistant physician and pathologist to the Royal Free Hospital, and was also elected assistant physician to the Brompton Hospital, where he acted as pathologist. All of these posts by a quiet but unrelaxing attention to their various claims he managed to fill with remarkable competency, amassing an immense and varied store of clinical experience which he kept always at his immediate disposal. In 1892 he was elected F.R.C.P. having now become assistant physician to St. Thomas's Hospital, where he was lecturing on pharmacology and therapeutics. In 1900 he became full physician to the hospital, and until the time of age retirement discharged his duties towards patients and students alike in an admirable way.



SIR HECTOR MACKENZIE.

Photograph by Lafayette.

Mackenzie's connexion with the Royal College of Physicians was an important one. He was censor from 1916 to 1918 and senior censor in 1921 and 1922. In 1916 he delivered the Bradshaw lecture, taking as his subject Exophthalmic Goitre, and in 1922 the Lumleian lectures upon the Diseases of the Thyroid Gland. These two subjects he made particularly his own, while in delivering the Bradshaw lecture he was able to show that he had for many years been interested in exophthalmic goitre, for in dealing with the incidence of the disease he brought forward the records of 438 cases, of which 263 were seen at St. Thomas's Hospital and 175 were private cases, no doubtful or incomplete cases being included in the

series. A summary of results and views on operative treatment was succinctly given, and the conclusions were come to that ligature of the thyroid arteries should only be a forerunner of thyroidectomy, which itself does not cure unless a sufficient amount of gland is removed. It is interesting to note that these conclusions were reached some years after in the articles on diseases of the thyroid which he contributed to Allbutt and Rolleston's "System of Medicine." The contribution to that System on the subject of exophthalmic goitre is a comprehensive and interesting essay in which the dangers and advantages of surgical methods of treatment are summed up in a critical way. The author's personal share in the discovery of the value of the internal use of thyroid preparation is, characteristically, well-nigh concealed.

In respect of further writings Mackenzie's long and assiduous work at the Brompton Hospital was reflected in an essay on physical signs of the lungs and heart also contributed to Allbutt and Rolleston's "System of Medicine." The difficult task of expressing in writing descriptions of sounds as they are to be heard in certain places or in certain circumstances was here most anxiously undertaken and in a very successful manner.

Hector Mackenzie was a learned doctor and a successful clinician, and his death will be deplored by a large circle of friends and patients.

CHARLES MAXWELL EKINS, M.R.C.S. Eng.

Dr. C. M. Ekins, whose death occurred at the Anglo-Swiss Hospital at Alexandria on Feb. 10th, was the eldest son of the late Major-General Charles Chester Ekins, Indian Army. He studied medicine at University College Hospital, and in his student days was a prominent Rugby football player. He went to Egypt at the end of the South African War, in which he had served as civil surgeon, and entered the Department of Public Health of the Egyptian Government Service. After a few years' experience in the provinces, he was appointed in 1906 to the important post of director of the government hospital at Alexandria. This post he held until 1924, when in conjunction with many other British officials he retired from the government service. "During these 18 years," writes a colleague, "he did not spare himself in his endeavour to make the hospital efficient and to keep it so. At this time he won very general affection and esteem. As an administrator he was fair and just. But he was much more than an administrator and organiser; he remained always the clinician. On retirement in 1924 he started private practice. This he greatly enjoyed. The humanity of the man, his bright and cheery manner, his sympathy with sorrow, his knowledge of people, together with his wide medical outlook, made him beloved and a success wherever he passed. He will be missed by a wide circle of patients and friends."

A year ago Dr. Ekins became honorary physician to the Anglo-Swiss Hospital, Alexandria, and six months later was appointed its honorary medical director. Unfortunately his health broke down during the summer, when on vacation in England, and this illness necessitated an operation from which he never properly recovered.

Dr. Ekins married Sara, daughter of Mr. Edward Pentilli, late of Alexandria, and she survives him.

ALEX HILL, O.B.E., M.D. Camb., F.R.C.S. Eng.

Many of our readers will have seen last week with much regret the announcement of the death of Mr. Alex Hill, neurologist, scholar, and a well-known authority on education, which occurred on Feb. 27th at Upper Bassett, Southampton, at the age of 73. Alex Hill was the son of John Hill, of Loughton, Essex, a London stockbroker, and was educated at University College School and Downing College, Cambridge, where he graduated with distinction, and was duly elected a Fellow in 1880. Deciding to enter the medical profession—Downing having always had distinct affiliations with medical science—he joined the medical school at St. Bartholomew's Hospital, and qualified by graduating in medicine at Cambridge and taking the F.R.C.S. Eng. For a time he worked at Cambridge and elsewhere in neurological research, delivered Hunterian lectures at the Royal College of Surgeons of England, 1884–85, translated a well-known German book on the central nervous organs, and established a position along this line of work which was later recognised by election as President of the Neurological Society. But in 1888 he was elected Master of Downing College, and from this date forwards his name has been constantly associated with developments in secondary education. He was Master of Downing for some 20 years, being Vice-Chancellor of the University in 1897 and the following two years. During his tenure of office he became widely recognised as an authority on education generally, though his publications on the subject were confined mainly to scientific aspects. Five years after his resignation of the Mastership of Downing he was appointed principal of University College, Southampton, a post which he held for seven years. He became President of the Teachers' Guild of Great Britain; he was a Commissioner in 1901 reporting to the Treasury on Universities and Colleges; he was a member of the Welsh Colleges Committee; secretary to the Congress of Universities of the Empire in 1912; and for 20 years chairman of the National Home Reading Union. Wherever, in short, there was practical work to be done, in association with the multifarious sections into which the conduct of education falls, Dr. Alex Hill was ready with his time, his work, and his enthusiasm. From the strict paths of medicine he had long strayed, but his travel-books show his abiding interest in medical progress.

ALBERT REVERDIN, M.D. Lausanne.

Dr. Albert Reverdin, who died on Jan. 29th at the age of 48, was one of the most renowned and popular medical men in Switzerland. He was the son of one well-known surgeon, Auguste Reverdin, and the pupil of another, having been chief assistant to César Roux, in Lausanne for many years. In 1912, being greatly interested in the work of the Red Cross, Reverdin went to the Balkan war to assume the direction of the "Vaud-Genève" ambulances. He proved to be an efficient organiser as well as a distinguished surgeon, and received honours from Serbia and from Greece. He returned to Geneva in 1913, and began to build a big up-to-date clinic. Then the Great War broke out. Reverdin at once offered his services to the French Government, and was entrusted with the charge of the large War Hospital in Bourg, being appointed also surgeon-in-chief and inspector-general of the VIIth region. For his war services he was made an officer of the Legion of Honour. In 1919 he was able to return to Geneva to open his new clinic, which was equipped with X ray plant as well as fine operating theatres, consulting rooms, and research laboratories. Besides his clinical work, Reverdin for some years held the post of chief of a surgical department at the Hôpital Cantonal de Genève. As a vice-president of the International Red Cross Committee he brought about a great number of useful reforms, and he devoted much of his time to this work. The brancard he invented is now used widely in armies.

Dr. Robert Duby, of Geneva, writes: Those who saw Reverdin operate were struck by his great dexterity and rapidity of action. As an inventor he distinguished himself in many directions. In surgery we have Reverdin's needles, Reverdin's pincers, &c. We owe him also Nidrose, a malleable substance, which in many cases can take the place of plaster. With his technical skill was associated excellent judgment. Severe with himself, he was severe with others, and there was military discipline in his operating-room as well as in the whole clini c

But he was interested in his patients from the moment they entered the clinic, and he never forgot them. To him the operation was an important part in the treatment of their illness, but not the only thing that counted. He avoided operating when he could. Because he was a master of surgery and yet was never mastered by it his name will be remembered as a great clinician, and his early death will be deplored by the increasing circle of practitioners who relied on him for sound advice.

JOHN LAIRD, L.R.C.P. IREL.

THE death occurred at Glenarm, Co. Antrim, last week of Dr. John Laird, who practised in Sligo for some 50 years and retired a few years ago. He was 86 years of age. He obtained the licence of the Royal College of Surgeons in Ireland in 1865, and of the King and Queen's College of Physicians in 1868. Having spent a year or two in hospital work in England, he was elected dispensary medical officer for the Sligo district while still a very young man. He speedily acquired the reputation of a careful and able practitioner, and for half a century he was one of the leading physicians and obstetricians in the West of Ireland. Tuberculosis was and is very common in that region, and he gave special attention to the study of that disease, having a considerable success in treatment. In 1912 he published his views in a small book, "Notes on the Treatment of Tuberculosis," of which a second edition, entitled "Tuberculosis: Its Prevention and Treatment," appeared in 1925. Though the theories he had arrived at are not likely to be accepted, the book is the fruit of wide reading and careful observation. Dr. Laird was a man of retiring disposition who took little part in public affairs, but he was held in high respect for his personal and professional qualities by the public and by his colleagues.

FREDERICK CLAUDE EVILL, M.R.C.S. ENG.

Dr. F. C. Evill, whose death occurred at Worthing on March 3rd, had been in practice in High Barnet all his life. Born at New Wandsworth in 1861, he was educated at Clifton College and St. Bartholomew's Hospital, London, qualifying in 1886. He was then house physician at Brompton and house surgeon at Bart.'s and at the Central London Ophthalmic Hospital, before a breakdown in health occasioned a voyage to Australia, where he remained for six years as surgeon to the Broken Hill Hospital, N.S.W. As a practitioner in an important residential suburb he kept closely in touch with scientific medicine, as his occasional but weighty contributions to medical literature clearly testify, and he was for thirty years surgeon to the Victoria Cottage Hospital at Barnet. As a young man Dr. Evill was an unusually accomplished amateur actor, and those who may have seen him in hospital entertainments, notably at Bart.'s and Brompton, will long remember the compelling humour of his characterisations. He was also in his early days quite a good amateur painter.

LEEDS AND BOLTON WORKERS' PENNIES FOR HOSPITALS.—The Leeds Workpeoples' Hospital Fund has had a record year. The sum collected in 1928 was £44,560, an increase of over £1000 compared with 1927. Almost the whole of this sum has been collected in the workshops, factories and clubs in the city, chiefly by means of weekly collections of coppers. The fund maintains two convalescent homes in Yorkshire, and last year 614 women and 676 men enjoyed rest and recuperation in them. Grants totalling £33,427 were voted at the forty-second annual meeting. These included £23,077 to the Leeds Infirmary, £3551 to the Leeds Dispensary, £2959 to the Leeds Women's and Children's Hospital, and £947 to the Leeds District Nursing Association. Since its inception the fund has distributed over £1,000,000. The workpeople of Bolton and district by giving 1*d.* or 2*d.* from their wages each week, contributed last year £16,400 in aid of the funds of the infirmary.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MEDICAL MEN AND THE ARMY.

IN the House of Commons on Thursday, Feb. 28th, Sir L. WORTHINGTON-EVANS (Secretary of State for War) introduced the Army Estimates for 1929, and said that the House might not perhaps appreciate the extent to which men of eminence in their respective professions were willing and anxious to place their experienced advice and expert knowledge at the disposal of the Army Council. He would like to draw special attention to the assistance which was given to them by members of the medical profession. The Army could derive nothing but benefit from a good understanding between the civilian and the military branches of the medical profession, which he was happy to believe was the aim of both and which displayed itself in their fruitful coöperation on many committees. He hoped that as the scope and attractiveness of the Army Medical Service became better known through their advocacy the present welcome increase in the number of candidates might continue. They were, however, still suffering from a serious shortage of candidates for commissions in the regular army. The shortage was, he believed, mainly due to economic reasons. He believed that the Army offered just as good a career as ever it did.

In the debate which followed,

Mr. BECKETT raised the question of the circumstances under which men are invalided out of the army. He had had cases brought to his notice where men who were beginning to make their way upwards had been discharged on medical grounds without adequate reason. A lot of kind things were said about army doctors; he dare say they were true. His own experience was at an abnormal time of rush and he may have been prejudiced. But, however adequate the average army doctor might be as a general practitioner, he was not an ultimate authority when it came to the question of a serious and deep-rooted disease. These men who were discharged had no appeal. The Admiralty had given way on this point and had agreed that men discharged on medical grounds should have the right of independent appeal. Was it not fair that the Army should give a similar concession?

Replying to the debate, Mr. DUFF-COOPER (Financial Secretary to the War Office) assured the House that there was an improvement in the health of our troops in China.

HOUSE OF LORDS.

TUESDAY, FEB. 26TH.

LOCAL GOVERNMENT BILL.

The LORD CHANCELLOR, in moving the second reading of the Local Government Bill, said that local government in this country was firmly rooted in our traditions and formed part of the essential framework of our democracy. Since the limits of local government must be defined by statute and could not have the flexibility of common law, it followed that as the conditions changed difficulties must arise which the old traditions were unable to meet, and development must be hampered by restrictions which by the effluxion of time had become obsolete. The present system was laid down in 1888 and had not been substantially altered since 1894, and when they recollected the changes which had taken place in our civilisation, in the means of transport and even in the conception of the duties of citizenship since that date, it was not surprising that the time had now come when a change was almost essential if the efficiency if the machinery was to be maintained.

The first problem with which this Bill occupied itself was one which had long been recognised as urgently requiring consideration—namely, the problem of the poor-law. The present system dated back to 1834, when the present poor-law unions were established. Boards of guardians were set up charged with the responsibility of relieving poverty within their areas, with powers of raising money which no local council could interfere with or control, in areas which had remained fixed ever since, although the whole industrial revolution of this country with all the changes of distribution of wealth and population which that revolution had brought about had taken place after the date when those boundaries were first allotted. The boundaries in many cases cut across local government areas and embraced in one union parts of different parishes or even counties. The poor rate varied to-day in different unions from 2½*d.* in the £ to 10*s.* 6*d.* in the £, and in the same county they could find one union which levied a poor rate of 7*s.* in the £ and another which levied one less than 1*s.* in the £. It was no reflection on the capacity

of the men and women who had given many years of invaluable service to a very laborious public work to say that the present system of boards of guardians was obsolete in its construction and unjust in its operation. Its abolition had been advocated by every party in the State. That point was one on which both the Reports of the Royal Commission of 1909 were agreed and it was the subject of a unanimous recommendation from the Maclean Committee some nine years later. Rates were originally levied mainly for the relief of the poor and the payment of certain minor country expenses. When during the middle of the last century public interest began to awaken to the importance of public health and to demand from the rates the provision of adequate social services in the way of drainage, water-supply, and so on, England's industrial supremacy was still at that date unchallenged. Any burden which a local factory was called upon to bear could be passed on without undue difficulty to the consumer in markets in which he held the practical monopoly. All that was changed to-day when we found ourselves in every foreign market competing bitterly with those who were once our customers and who were now our rivals. To-day the burden of taxation might make all the difference between the survival and the extinction of an industry. Of all taxation rates were perhaps the most burdensome. Now that the rates were the recognised means of providing so many social services which in old days were entirely outside their scope, it was not right that industry should be called upon to bear the full burden of their provision without regard to the question whether there were funds available out of which to make such provision. Proceeding to deal with the

Relationship between the National Exchequer and the Finances of Local Government Areas,

the Lord Chancellor said that the result of the percentage grant system was that the amount received by the local authority depended not upon its need, but upon its expenditure. The Government had seized this opportunity so to adjust the relations as to secure that the Exchequer grant should go where it was most needed and that the provision of money from the national Exchequer should be regulated in such a way as still further to redress the inequalities which the spreading of the areas would not completely extinguish. Three matters had been taken into account—the poverty of the district, abnormal unemployment in the district, and the sparseness of population in the district. In order to make allowance for the poverty of the district an addition was made to the actual numbers of the population by taking into account two matters: (1) the rateable value; (2) the number of children under 5 years of age. This latter factor was brought in because it had been found in practice that the poorer districts were those in which the larger number of children were to be found. While the formula was admittedly complicated in statement as an arithmetical formula, he claimed that in operation it was quite simple. By its aid it was believed that a means had been evolved which without any claims to mathematical accuracy so adjusted the grant of public money from the National Exchequer to the various local areas as to ensure that each received according to its needs and that the inequalities of the past would disappear for the future. Machinery was provided in the Bill for the easy readjustment of local boundaries both between districts and electoral areas. Commenting on the provisions of Part I. of the Bill, the Lord Chancellor said that one of the great advantages of this part of the Government scheme was that the overlapping which had existed in the past ought in the future to cease, and that it would be possible by centralisation and specialisation in selected institutions to provide a far more highly skilled service than was possible to-day. There was given power for different poor-law authorities to combine for the provision of an institution which neither singly might be able to afford, but which might be essential in isolated cases. The Bill provided that the existing disqualification of guardians who had received poor-law relief should be extended to the new authorities, but that the disqualification should not exist by reason only of the receipt of medical or surgical relief in an institution. Express power was given to the county councils for the provision of hospitals and maternity homes, or for the making of subscriptions or donations to existing hospitals and institutions. Provision was made for the recovery from those who accepted assistance in these public institutions of a contribution towards the expense, but this did not apply to infectious disease hospitals, including those for the treatment of tuberculosis and venereal disease, since it was in the interests of the public at large that persons should be isolated in those institutions as soon as possible. Further provision was made to enable the Minister of Health to postpone the operation of the Bill in those cases in which it had been found necessary to supersede the existing board of guardians by reason of their default. Under Part 3 of the Bill, which embodied amendments of the law with regard to highways, provision was made for the county councils as the highway authorities to be given powers under the Town Planning Act—powers which many people thought they ought to have had from the commencement. Provision was made under Part 4 of the Bill for various minor alterations in local government law; for instance, the acceleration of the process under which medical officers of health became full-time servants of the State, and the making of regulations prescribing the qualifications of such officers and of health visitors. Provision was further made for a survey by county councils of the existing accommodation of hospitals for infectious diseases, and the preparation of a scheme where necessary for the provision of adequate accommodation. In conclusion the Lord Chancellor asked their Lordships to say that the Government had correctly diagnosed the ills under which local government was suffering, and that the remedies that they had prescribed were well calculated to cure those ills. Finality in progress or perfection in execution were beyond human achievement. He made no claim for either in this Bill; but he did claim that for many years to come the measure would stand out as a landmark in the progress of local government in this country, and as a monument to the vision and courage, to the breadth of conception, and mastery of detail of the Minister of Health.

Rejection of the Bill Moved.

Lord PARMOOR, in moving the rejection of the Bill, urged that the diagnosis to which the Lord Chancellor had referred was wrong, and that the suggested remedies would not cure the ills that existed. The inequity of our rating system consisted in placing on ratepayers the charge of mainly national services. The Bill did nothing to put an end to that glaring inequity. The poorer districts would be worse off than at present. The excellent work which had been done by poor-law guardians would not be adequately performed in future as the new local bodies were to be given no responsibility either as regarded policy to be followed, the money to be provided, or the officials to be appointed. He contended that the vast majority of students of the poor-law system to whatever party they belonged, felt that the expense of able-bodied unemployed should be a charge on the State and not on a particular locality. He thought that the principle of a block grant was a mistake, and that a far better way was to found the grants on efficiency.

After further debate the discussion on the Lord Chancellor's motion was adjourned.

WEDNESDAY, FEB. 27TH.

The adjourned debate on the second reading of the Local Government Bill was resumed.

Increased Powers of the Ministry of Health.

Earl BEAUCHAMP said that it would be idle for the most determined opponent of the Government to declare that there was not a considerable amount of good in the Bill. But it was the business of the Opposition to concentrate on criticisms, and there was, in the first place, a considerable increase in bureaucratic powers. There was, running all through the Bill, an increase of power to the Minister of Health and to the members of the Ministry. With the two principles underlying the Bill—the necessity for some change in local government and the relief from rates—they all agreed; his criticisms were as to the methods by which it was proposed to apply these principles. In regard to the reform of the poor-law the Government proposals were not bold enough. The problem of the able-bodied unemployed was entirely shirked. Was there not something in the complaint that the county councils would be having too much work placed upon them and that their duties would be increasing to such an extent that it might become difficult in the future to find people to undertake them? The Bill did not break up the poor-law, but transferred the work to other bodies. Poor-law functions, he suggested, ought to be split up in three directions—the oversight of mental deficiency in children should be given to county and borough councils; relief of the able-bodied poor should be delegated to the insurance committees of which they had heard something, and linked up with unemployment insurance; and the relief of the other poor should be dealt with by Home Assistance Committees. Referring to the maintenance of health services, Lord Beauchamp said he distrusted the system of block grants. Percentage grants had not done badly on the whole, and he suggested that there might be a combined system beginning with block grants, followed by percentage grants, so as to encourage local authorities to spend more on health services than they were spending now.

A Constructive Measure.

Lord DAWSON said that whatever opinions might be held on the Bill all would be agreed that it was a great constructive measure which showed vision and far-reaching knowledge. For himself, in spite of the lucid exposition given by the Lord Chancellor, he still found himself in the mazes of derating. He proposed to limit his remarks to Part I. of

the Bill, of which he had some knowledge, and particularly to that part of it which concerned the foundations of hospitals. He did so with less hesitation because in the House of Commons pressure of time was such that discussion was strictly limited. In the clauses of Part I. there were provisions which enabled and, more than that, might easily encourage councils to found general hospitals for the treatment of general medical and surgical disease. Whether this was a right or wrong policy it was a new departure and one which probably ushered in a new era in the administration of medicine in this country. He was inclined to think that the proposals were right if they were suitably safeguarded. He asked the House to imagine the whole field of curative medicine, of which neither the councils nor their medical advisers had had any previous knowledge or experience. They had gained a certain limited knowledge in the application of curative medicine in the tuberculosis clinics and in maternity. As regarded that large field of general surgery and medicine treated in the general hospitals of this country their experience amounted to extremely little. The fact that the councils had run poor-law hospitals was but little training for the running of big general hospitals such as they knew them and understood them. These powers which were given in the Bill would enable the councils not only to convert poor-law hospitals into general hospitals, but give them the power of founding general hospitals. These powers came at a time when the demand for hospital accommodation was increasing throughout this country. The fact was that the hospitals were no longer the need of a class; they were the need of the whole nation. They used to be for the sick poor; now all were poor and sometimes sick. Anyone might need a hospital in these days. The progress in knowledge demanded it. Social and economic conditions demanded it. The first reason was the progress of knowledge.

Team Work Necessary.

The art of medicine, Lord Dawson continued, now called to its aid a number of sciences, sciences mobilised on its behalf. These new sciences required team work. Years ago a cough or a disease of the chest required a stethoscope and a bottle of medicine. To-day they required besides the clinical knowledge of the physician the radiologist and the bacteriologist. A surgeon who wished to operate on the stomach now required besides his own skill the skill perhaps of the chemist or the radiologist. In other words, there was the necessity of bringing together many branches of knowledge which had to act in coördination if they wished to attain their result. That could only be done by organisation. Each of these specialties required its equipment. These equipments had to be brought together not only for efficiency, but for cost, because they had this striking fact that the more science progressed the greater the cost of treatment became. Therefore, but for what he might call mass production, a large proportion of the community would be without those benefits. That, then, was a reason why people in increasing numbers needed institutional treatment, which in other words was hospital treatment. It was a fact which had to be admitted that the voluntary hospitals of this country could not entirely fulfil those functions. It seemed to him that the question—he had no doubt that it was before the Government when they drew up the Bill—was how this hiatus was to be filled up. There was one way in which there could be a considerable extension of a form of coöperative hospital in those homogeneous communities which were increasing in number and were known as garden cities and garden suburbs. There was great scope there for a system of coöperative treatment and for coöperation in matters of health. By linking up these coöperative health societies with the insurance companies there could be a certain solution of the difficulty of hospital provision. Even when that was allowed for there still remained a large gap to be filled. That was why he thought it was proved and a case made out that further hospital provision was needed. In short, it came to this, that all the conditions of to-day tended to move the location of illness from the home to the institution and the need for this hospital accommodation was great. They had to remember, however, that neither the councils nor their medical advisers had had up to now any experience of the curative treatment of disease. If, for example, they took the medical staffs who advised the councils they consisted of medical officers of health and certain people who looked after the clinics. Their experience was limited to their own domain and very excellent work they did; but their experience of curative medicine was little or none; yet they would be called upon under this Bill to fulfil those important functions.

Hospital Organisation.

It must be borne in mind that four-fifths of the medical men of this country were engaged in curative medicine. It was in this respect that he thought that Part I. of the Bill was defective. It seemed to show a lack of appreciation of the essential conditions of success. It was almost as if it said in effect to the Public Assistance Committees: "You can convert your poor-law hospitals if you wish. You can build large hospitals if you wish. I would like you to coöpt a few people who know something about the running of a general hospital, but I will not force you to do so." No doubt some councils would think that anybody could found a hospital. A hospital was not a building made with hands; it was an organisation, an assemblage of great traditions. The hospital service of this country had grown up through the years. Its efficiency, its flexibility of administration, its public spirit, and its warmth of heart had all gathered round what was called the voluntary system. That system had made the hospitals of England famous throughout the world. More than that, these hospitals drew to their service the young man of talent. It was his great ambition to get there. There he worked for years at a pittance in order to gain experience. There he earned his reputation and his discipline. There he got that curious atmosphere of knowledge and service. That was the current of events. That was the recognised road within the profession. Further than that, it was from these hospitals that the nurses came. Was it not obvious that the voluntary hospitals of the country should be made the centre, the kernel round which any new hospital system should be built, and that any legislation should provide that this mode of progress was not only permitted but secured? Surely the correct policy was to foster the voluntary hospital, remembering that it was a very tender plant, and might easily be killed. Let the voluntary hospital lead, let it direct them in building up what he admitted was needed—that was a new and extended hospital policy for the country. The dangers of not doing this were very real. Supposing their was no coöpted minority on these Public Assistance Committees. Supposing, for example, they had a free hand to do what they wished. Supposing (and this was not imagination) a council was returned committed to the policy of a whole-time medical municipal service. That council would set out to build up a service independent of the voluntary hospitals, competing with them and overlapping them, and there was no one to say them nay. That was no mere figment of the imagination. There were at this moment boroughs running, or trying to run, a municipal service. There were certain people who avowed that their object was to set up municipal hospitals and to staff them with a full-time staff and run them as a form of municipalised service. That, surely, would be a disaster. How were they going to get their staff? He presumed they would advertise for it, just as if skilled men like physicians and surgeons grew like gooseberries on a bush. It had already been tried. Advertisement did not bring the right people. It did not secure that round pegs went into round holes, and there had been already consequences which were lamentable, resulting from the wrong people staffing hospitals and doing work for which they were not trained and not suited. That was a very serious danger. If they permitted the councils, whose experience of running curative medicine was up to now small and had almost reached diminishing point, to undertake that new venture without any form of coöption of people who were skilled on the one hand in the administration of hospitals, and on the other hand without any assistance from doctors whose lives were spent in doing the work of curative medicine, there was a very serious danger. He pleaded with the Government to make it compulsory that there should be coöption of a minority on these Public Assistance Committees. It was done in the case of education. If it was sound to do it for education why not do it for health? There was no argument for the one which was not applicable to the other. When the Bill was before the House of Commons the Government had not been able to take a full measure of the opposition to the Bill, and he had no doubt that when they made coöption optional they did it because they did not wish to increase the opposition in the country. But it was surely clear now that the country was in favour of the Bill and there was no longer therefore an excuse for not doing that which all those people who were connected with the administration of public health outside the official world were in favour of doing. The medical profession by practical unanimity had requested that the coöption of the minority skilled in hospital work should be made compulsory, and they appealed very strongly to the Government to concede that point. King Edward's Hospital Fund had taken the same line and on the merits he asked the House whether they would start a new measure and a sound venture, one that might lead to a wide establishment of municipal hospitals for curative medicine in this country and neglect all the traditions and the knowledge that had been gathered during the years.

A Simple Remedy.

There was one other amendment which he would urge on the Government. Up to now the medical staff of the health services of this country had been run by a small number of medical men. They had been men who had specialised in preventive medicine. They had consisted in

the country of medical officers of health, tuberculosis officers, school medical officers, and he would guard himself by saying that there was no one who admired their work more than he did, but it was a work of a strictly limited application. They had never had anything to do with disease. Many of them had never had any contact with hospitals since their student days. How could these men be expected wisely to advise their councils on this large question of curative hospitals? Ever since the Ministry of Health Act was passed it had been a most regrettable fact that the policy of the official doctor—the doctor who was paid by fee, the medical officer of health and the officers he had already noted—proceeded on lines totally divergent from that of those doctors who constituted four-fifths of the profession and who belonged to the curative branch. That divergence was lamentable. It was a serious matter when the council only had to deal with preventive medicine, and it was a still more serious thing if this divergence should continue now—this divergence for which the Ministry of Health had been responsible ever since it was founded. To meet that he suggested quite a simple method which had been before the Ministry of Health for some time, and that was that there should be set up under the chairmanship of the medical officer of health an advisory council of doctors in each district which the council administered. This simple remedy would bring the experience of the men who knew to the benefit of the medical men who had to administer. He believed that the hospital policy in the Bill was capable of great and continued benefit to the community, and if only the Government would accept the safeguards which he had adumbrated in the form of amendments at a later stage they would ensure that the scheme not only brought about reforms, but opened up avenues of progress which would lead to the greater health of the people, in which respect they would fain see this country lead the way.

Further Criticism of the Bill.

Lord THOMSON said that an expert in local government, of 35 years standing, had told him that the Bill was a gamble, that it was based on figures which were guesswork, and that the formula provided a rule-of-thumb, but embodied no principle. The money which would be given to industry was so small in each case that it would not do any good. In his (Lord Thomson's) view the Bill was timorous because it did not attack the central and urgent problem of the necessitous areas.

Lord CRANWORTH said that he welcomed the Bill because it made a first attack on the pernicious tyranny of the percentage grants under which so much public money had been wasted. He believed that, viewed as a whole, the Bill was the best measure brought forward since the war.

Earl RUSSELL said that he must take strong exception to that part of the Bill which dealt with recovering the cost of maintenance of persons in various institutions. It read as if it must be the duty of the local authority to collect the costs to the last farthing, and in Committee the Opposition would endeavour by amendments to soften the harsh character of that proposal. They would also seek to obtain security of tenure for the officials of the local authorities. On the general question of rating relief he said that to give relief to the rich and to put additional burdens on the poor was not the Labour Party's conception of justice. It should not be beyond the wit of man to devise a method which, while giving relief to the individual, did not enrich big firms.

Reply to the Debate.

The Earl of ONSLOW (Paymaster-General), replying to the debate, said that the Bill had not been wholly condemned by any speaker. Lord Beauchamp had complained that the bureaucratic powers of the Minister had been greatly enhanced. But where they had arrangements for the transfer of areas and the adjustment of boundaries, there were found to be disagreements, and it was generally recognised that the only person to whom those disagreements could be referred was the Minister, who was entrusted with the business of local government. Dealing with the criticisms of the purposes for the reform of the poor-law, the noble Earl said that the principle of the Act of Elizabeth had not been really interfered with. The statement had been very freely made that the Bill did not break up the poor-law. The fact was that the Bill dealt with the transfer of the poor-law powers from the guardians to the counties and county boroughs. It did not pretend to break up the poor-law at this time. But it was intended to encourage the break up of the poor-law, and the adoption of the transferred functions under other Acts so far as it was possible. The Bill had been criticised as being too long, and if they had attempted to amend the huge Consolidated Poor Law Act of 1927 the Bill would have been greatly overweighted. Also, any such attempt at present would mean that they would not have the advantage of being able to discuss the amendment of the poor-law with those who were responsible for it, because the guardians, under the Bill, were in a moribund condition, and the counties and county boroughs had not yet come into their inheritance. But it was recognised that the existing poor law and the existing poor-law arrangements must be discussed with a view to reform, and therefore it was proposed to initiate discussions, at a convenient time after the passing of the Bill, with the associations representing the poor-law authorities as to what changes might be necessary in the Act of 1927. Another criticism had been that the Government had not taken unemployment out of the Bill and dealt with it as a national service. But, had they adopted a national system of dealing with the able-bodied unemployed, it would have been impossible to avoid a rigid bureaucratic organisation, with far more hard-and-fast rules than was necessary under the organisation proposed in the Bill, and with an army of officials. Also, it would have been necessary to have two authorities dealing with same people—the national authority dealing with the well and able-bodied, and the local authority dealing with the sick and unemployed. The result of that would have been constant confusion, overlapping, delay, and dissatisfaction. Further, it would be difficult to administer such a service nationally without a return to the principle of the "dole."

The motion for the rejection of the Bill was negatived by 102 votes to 20—majority against, 82.

The Bill was then read a second time.

THE BILL IN COMMITTEE.

On Tuesday, March 5th, the Local Government Bill was considered in Committee, the Earl of DONOUGHMORE in the chair.

Provisions as to the Alternative Powers of Giving Assistance.

The Marquess of READING moved an amendment to Clause 4 providing that in so far as administrative schemes prepared by councils under the clause related to hospitals the councils should take reasonable steps to seek and to continue to secure full coöperation with every voluntary hospital within or serving the area of the council. He strongly urged the Government to accept the amendment.

Lord DAWSON also had an amendment down on the Order paper to the following effect:—

"A council, in preparing a scheme under this section, shall have regard to the desirability of consulting (*a*) any body existing in the area which is so constituted as to be representative of the voluntary hospitals in the area, and (*b*) any body existing in the area which is so constituted as to be representative of the duly-qualified medical practitioners in the area, including those on the medical and surgical staffs of any voluntary hospitals in the area."

The Earl of ONSLOW (Paymaster-General), who represented the Ministry of Health, said that he was prepared to move the following new clause in order to meet the views that had been expressed on behalf of the voluntary hospitals:—

"The council of every county and county borough shall make such arrangements as they think desirable for securing that the functions transferred to them under this Part of this Act with respect to the provision of hospital accommodation will be discharged after consultation with such body, if any, within the county or county borough as they consider to represent the voluntary hospitals in the area."

In the debate which followed the view was expressed that the Government's new clause was too vague in its terms, and it was also criticised on the ground that it did not meet Lord Dawson's point in regard to the consultation of the medical profession in each area.

The Earl of ONSLOW assured the House that it was the wish of the Government to settle the matter in accordance with the desires of the House. He undertook to have the clause redrafted before the Report stage, and he hoped that in its altered form it would be acceptable both to Lord Dawson and to the rest of the House.

The Marquess of READING withdrew his amendment.

Lord DAWSON, in intimating that he would not press his amendment, said he hoped that they would get something more out of the Government.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 27TH.

Sterilisation of the Unfit.

Colonel WEDGWOOD asked the Minister of Health whether he had received a petition signed by many doctors and eugenists, asking for the sterilisation of criminals and mental defectives, and whether the Government intended to take any sort of action in the matter.—Mr. CHAMBERLAIN replied: I have received a resolution urging that an inquiry should be held into the best method of dealing with mental deficiency, including a special inquiry into the possibility and advisability of legalising sterilisation under proper

safeguards and in certain cases. I am not yet in a position to indicate the intentions of the Government in the matter.

THURSDAY, FEB. 28TH.

Workmen's Compensation Statistics.

Mr. TINKER asked the Home Secretary if he was aware that the workmen's compensation statistics presented to Parliament each year did not give a complete list, and that no returns were given from agriculture, road transport, building, and many other industries and occupations; and if he intended to ask Parliament to extend Section 42 of the consolidating Act of 1925 which gave him powers to call for returns from seven great industries, so that all who came under the Workmen's Compensation Act must make returns.—Sir WILLIAM JOYNSON-HICKS replied: Yes, Sir, the present Regulations under Section 42, which require returns to be furnished, do not extend to all industries. The hon. Member will find the reasons for this explained in the Introduction to the Statistics for 1908. The reasons still hold good, but the extension of the Regulations to other industries is noted for consideration as soon as conditions permit. No fresh legislation is required for the purpose.

Scavenging in Rural Areas.

Rear-Admiral BEAMISH asked the Minister of Health whether he would issue an order or introduce legislation to amend Section 42 of the Public Health Act, 1875, to permit of scavenging and cleaning over limited areas of rural parishes and to charge the expenses to that area, and thereby control the growing heaps of insanitary household rubbish which now disfigured so many villages.—Mr. CHAMBERLAIN replied: I have no power to issue an Order for this purpose. The matter has been noted for consideration when an opportunity for legislation arises. I doubt, however, whether legislation would be the most effective cure, and it is likely that improvements would be effected if local authorities would use more freely their influence and their powers.

Health of the Mercantile Marine.

Sir RICHARD LUCE asked the President of the Board of Trade if the necessary sickness and mortality statistics were available or in process of preparation for the use of the joint committee appointed by the Board of Trade and the Ministry of Health to consider matters affecting the health of the mercantile marine.—Commodore KING replied: In addition to the statistics published by the Registrar-General of Births and Deaths there is an annual return published by the Board of Trade of all deaths which occur on ships registered in the United Kingdom. The question whether these statistics can be improved or supplemented is being considered by the Joint Advisory Committee.

Admission of Starved Persons to Hospitals.

Mr. GARDNER asked the Minister of Health whether his attention had been drawn to an account of an inquest at the court of the city coroner, held on Feb. 18th, on a man found by a police constable starved and ill on the pavement outside Holborn Viaduct station; whether he was aware that the man was taken to St. Bartholomew's Hospital because there was an arrangement not to send cases to the City of London poor-law hospital after 9 P.M., and that the man was refused admission and taken elsewhere and there refused and then brought back to St. Bartholomew's, and then put into an isolated room and found dead on the floor at about 1.30 A.M.; by what poor-law authority this arrangement was made and when, and whether it was known to the poor-law inspector or at the Ministry of Health; whether any similar arrangement existed elsewhere and, if so, where; whether he would inform the superintendents or masters of all poor-law hospitals that they must admit all cases of starvation and exposure brought by police officers without any order from the relieving officer; and whether he would revive the lists of starvation cases which were published from about 1870 till 1918.—Mr. CHAMBERLAIN replied: The reply to the first part of the question is in the affirmative. In reply to the second part there is not, and could not legally be, any arrangement preventing the admission of cases to the poor-law infirmary of the city of London Union or any other infirmary during prescribed hours of the night. The arrangement made between the guardians and St. Bartholomew's Hospital is that where a bed is available at the hospital cases shall not be sent on to the infirmary during the night, but shall be kept until the morning and then removed, and this arrangement seems to me a very proper one. If the patient had been sent to the infirmary he would have been admitted, as in fact I am informed that many other persons are admitted both by day and by night. As regards the last part of the question I do not think that any useful purpose would be served by a revival of the returns.

Medical Records in the Army.

Mr. SHEPHERD asked the Secretary of State for War whether there was any trace of rheumatism in the Army medical history of Mr. G. J. Ross, Louisa-street, Darlington, late trumpeter, Royal Artillery.—Mr. DUFF COOPER replied: The medical records of soldiers are confidential documents, and it would be contrary to the established practice to disclose details from them.

Dr. VERNON DAVIES: Does not the hon. gentleman see that in the case of an appeal a person is handicapped if he cannot get any particulars of the medical history of the case? He is placed in an absolutely impossible position.

Mr. COOPER: The previous history is open to the people advising the appellant.

Dr. DAVIES: The hon. gentleman has just indicated that it is not.

The Traffic in Heroin.

Mr. CECIL WILSON asked the Home Secretary whether, seeing that the heroin available for internal consumption in 1924 was 909 kilogrammes, that the manufacture and imports in the following year was 344 kilogrammes, the exports and re-exports 236 kilogrammes, and the weight available for internal consumption 108 kilogrammes, he could explain what became of the balance of 1017 kilogrammes in 1924 and 1925, seeing that this was many times the quantity available for internal consumption in other years.—Sir WILLIAM JOYNSON-HICKS replied: The explanation is that the figures include 745 kilos of heroin in 1924 and 15 kilos of heroin in 1925, which were not used as such, but were reconverted into morphine. If these figures are subtracted from those quoted by the hon. Member as available for internal consumption, it will be found that the balance in each year approximates to the general annual average of the surplus of heroin imported and manufactured over that exported and re-exported. The bulk of the heroin so reconverted consisted of illicit consignments to the Far East which were seized at Hong-Kong and sent home to this country for disposal.

Mr. WILSON: Can the right hon. gentleman say whether the amount of 108 kilogrammes is not in excess of that recommended by the Committee of the League of Nations and that the Chinese coolies do not destroy all the heroin that is seized in this way and whether we are making a profit out of it.

Sir W. JOYNSON-HICKS: The heroin is not destroyed, but is sent over here in order to be utilised for medicinal purposes.

MONDAY, MARCH 4TH.

Protection of Drivers against Exposure.

Mr. SHEPHERD asked the Minister of Transport what regulations prevented the provision on omnibuses, tram cars, taximeter-cabs, and other public vehicles, of adequate protection for their drivers against exposure to the weather.—Colonel ASHLEY replied: There are no general regulations which would prevent the provision on public service vehicles of adequate protection for their drivers against exposure to the weather, but there are, I understand, local regulations made by certain local licensing authorities limiting the use of windscreens on vehicles licensed to ply for hire.

Protection of Civil Population against Poison Gas.

Mr. ROBERT MORRISON asked the Prime Minister whether the scheme which had been prepared for the protection of the civil population against poison gas in future warfare would now be submitted to the local authorities in order that arrangements might be commenced for training the necessary personnel, as had already been done in other countries.—Mr. BALDWIN replied: As I indicated to the hon. Member on Feb. 12th, the problem of the protection of the civil population against gas attack is being closely studied in all its aspects. Further work, however, remains to be done before any scheme can usefully be communicated to the local authorities.

Death at Whipp's Cross Hospital.

Miss LAWRENCE asked the Minister of Health whether his attention had been directed to the circumstances attending the death of Miss Sarah Dicks at Whipp's Cross Hospital; whether he was aware that no communication of the death was made to the relatives of the deceased, a message being sent only to her lodgings; and whether he would cause inquiries to be made.—Sir KINGSLEY WOOD replied: This case was reported to my right hon. friend by the medical superintendent of the hospital. He learns that the case was put on the danger list immediately after admission and was visited by relatives who were informed that they could stay with the patient as long as they chose. The last visit paid by the relatives was within an hour of the patient's death which took place at 8.55 P.M. on Jan. 21st. In accordance with the usual practice of the guardians, which my right hon. friend considers a proper one, the relatives were not informed of the death that night, but notice was sent by special messenger at 8 o'clock on the following morning to the address furnished on the hospital bed-card.

TUESDAY, MARCH 5TH.

Use of Cocaine in Poor-law Institutions.

Mr. DAY asked the Minister of Health whether he had received any complaints of large amounts of cocaine used in any of the poor-law institutions in England and Wales; and if it was his intention to set up an inquiry into these charges.—Sir KINGSLEY WOOD replied: My right hon. friend has received no formal complaint of this kind, but he is aware of one instance in which a poor-law medical officer has used considerable quantities of this drug for his own treatment. The officer has resigned his appointment, and my right hon. friend sees no reason for further action on his part.

Disease Germs in Bombs.

Lieut.-Commander KENWORTHY asked the Secretary of State for War whether the War Office had information to the effect that bombs or shells carrying disease or plague germs were used by the German forces on the Western front during the great war.—Sir L. WORTHINGTON-EVANS replied: No, Sir. The War Office has no other information than that contained in the Official History of the War, Vol. II., Medical Services, Chapter 17.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation held on March 1st the following degrees were conferred:—

M.B. and B.Chir.—J. A. Hartley and J. D. Procter.
M.B.—A. J. Dix-Perkin.

The Council of the Senate have presented a report on an offer to equip a nutritional laboratory, which has been made by the Medical Research Council through their secretary, Sir Walter Fletcher, and recommend that the offer should be gratefully accepted.

SOCIETY FOR THE STUDY OF INEBRIETY.—At the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., on Tuesday, April 9th, at 4 P.M., Dr. J. D. Rolleston will open a discussion on Alcohol in Therapeutics.

TUBERCULOSIS OF BONES, JOINTS, AND LYMPH GLANDS.—A course on this subject will be held at the Hôpital Maritime at Berck Plage, Pas de Calais, France, from March 25th to 30th, under the direction of Dr. Etienne Sorel. Information can be got from Dr. Delahaye at the hospital.

THE Minister of Health has expressed his approval of a proposal to invite the International Union of Local Authorities to hold their next congress, which is due to take place in 1932, in this country.

SOFIE NORDHOFF-JUNG PRIZE.—This prize, offered for the best work in recent years on the investigation of cancer, has been awarded to Prof. Katsusaburo Yamagiwa, of Tokyo, for his research on the experimental production of cancer by cutaneous irritation.

A BRITISH SANATORIUM AT MONTANA (SWITZERLAND).—A new sanatorium, known as The British Sanatorium Montana, has recently been opened at this favoured spot high up in the valley of the Rhone by Dr. Hilary Roche, late medical superintendent of the Palace Sanatorium, Montana. The new sanatorium is intended for the reception of British patients only.

FINANCES OF UNIVERSITY COLLEGE HOSPITAL.—A festival dinner took place at the Mansion House last week in support of the appeal for £30,000 to pay off the accumulated debts on this institution, and to provide the nucleus of an adequate reserve. Prince George, the President, who was in the chair, announced at the close of the evening that the entire sum, and a little more, had been obtained.

RESEARCH ON RHEUMATOID ARTHRITIS. — The bequest of £300 to the University of Manchester, under the will of the late Miss Amy Henrietta Worswick, will be devoted in accordance with her wishes to the investigation of the causes and treatment of rheumatoid arthritis. A temporary fellowship of the value of £150 per annum will be offered, and application may be made to the Registrar before Oct. 15th next by any person who has obtained a medical qualification registrable in the United Kingdom.

GENERAL LYING-IN HOSPITAL.—It was stated at the annual meeting last week that among 1043 cases admitted last year there were only three deaths. Under the covenants of the lease the premises have to be rebuilt next year, and £19,500 is still required to meet the cost.

LONDON REFRACTION HOSPITAL.—On Thursday in last week the Countess of Mayo opened the enlarged premises of this hospital in Newington Causeway, S.E. It was originally established in 1922, and in the first year 563 patients were treated; last year the number was nearly 6,000. The institution has been built and equipped by the Institute of Opthalmic Opticians which is now asking for help towards its maintenance, the cost having outgrown the means of the institute.

INSTRUCTION FOR D.P.H.—A three months' course of lectures and demonstrations on clinical practice and in hospital administration will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, London, N. by Dr. F. H. Thomson, the Medical Superintendent, on Mondays and Wednesdays at 4.45 P.M., and alternate Saturdays at 11 A.M., beginning on Monday, April 8th. Particulars may be had from the Clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C.4.

POST-GRADUATE COURSE AT WEST LONDON HOSPITAL.—A syllabus has been issued of the lectures and demonstrations to be given in connexion with the post-graduate course to be held at the West London Hospital, Hammersmith, from March 11th to 23rd. The course will deal with general medicine, surgery, and the special departments, with special reference to recent advances, and there will be daily sessions from 10.30 A.M. to 5.30 P.M., except on Saturdays, when only the mornings will be occupied. The syllabus is obtainable from the Dean of the Post-graduate Medical College, who should be addressed at the Hospital, Hammersmith, W.6.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Particulars of lectures and demonstrations during the coming week will be found in our Medical Diary. Fixtures for April include a practitioners' course at the London Temperance Hospital, and courses in tropical medicine at the London School of Hygiene and Tropical Medicine, in electrotherapy at the Royal Free Hospital, in medicine, surgery, and gynæcology at the Royal Waterloo Hospital, and in neurology at the West End Hospital for Nervous Diseases. Copies of all syllabuses, and details of the general course of work in the London hospitals affiliated to the Fellowship may be had from the Secretary at 1, Wimpole-street, W.1.

A DEPUTATION ON PUBLIC HEALTH QUESTIONS.—Mr. Amery (Secretary for Dominion Affairs), Mr. Neville Chamberlain (the Minister of Health), and Mr. Betterton (Parliamentary Secretary to the Ministry of Labour) lately received a deputation from the General Council of the Trades Union Congress. In reply to the suggestion that the possibility of securing reciprocity with the Dominions in social insurance should be placed on the agenda of the next Imperial Conference, Mr. Amery said that apart from the Irish Free State the Dominions had not yet put into force comprehensive schemes for health, pensions, and unemployment insurance on lines corresponding to those in existence in this country, and consequently a scheme of general reciprocity was at present impossible. The matter had been considered by the Imperial Conference in 1926, since when it had been taken up with the Dominion Governments and some progress was being made. A health insurance Bill had been introduced into the last Commonwealth Parliament, and was likely to be reintroduced, and in South Africa a Royal Commission was considering the question of health insurance. He promised that, if the Government were returned to power, the question should be on the agenda of the next Conference. The deputation also submitted resolutions urging the Government to take further measures for dealing with the present housing situation by an extended building programme and the demolition of slum areas, and requesting the Minister of Health to give facilities to insurance committees so that Section 107 of the National Health Insurance Act, 1924, which is directed against bad housing and other conditions, may be made operative. This section enables inquiries to be made into the causes of excessive sickness in particular localities. Stress was also laid on the need for more women sanitary inspectors, the Trades Union Congress having agreed "that at least one whole-time woman sanitary inspector should be appointed on the staff of every metropolitan borough council and on the staff of every local authority administering a large industrial area." Finally a resolution on the abolition of privately owned slaughter-houses was brought forward. In his reply Mr. Chamberlain said that Section 107 of the Insurance Act had not proved workable in practice. The appointment of women sanitary inspectors could not be pressed upon the smaller authorities who employed one sanitary inspector only, but he agreed that in the metropolitan boroughs and other large authorities the appointment of women was desirable. As opportunities occurred he would be prepared to encourage the institution of public slaughter-houses.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—Hospitals within 11 miles of St. Paul's wishing to participate in the grants made by this Fund for 1929 should apply before March 31st to the hon. secretaries of the Fund, at 7, Walbrook, E.C.4. Applications will also be considered from convalescent homes in the above area or those which take a large proportion of patients from London.

DONATIONS AND BEQUESTS.—Mr. Arthur Wheeler Margrett, King's Heath, Birmingham, left on the death of his daughter £1250 to the General Hospital to endow a bed to be called the A. W. Margrett bed; £1000 each to the Royal Society for the Prevention of Cruelty to Animals, Lord Haig's Fund, and the Queen's Hospital, Birmingham; £500 to the Eye Hospital, Birmingham; £250 to the Women's Hospital, Showell Green, Birmingham; and the balance of such proceeds to the Home for Incurables at Putney.—Mr. Walter Richard Haighton Chappel, Great Duryard, Exeter, left about £20,000 to charities, including £2000 to the Princess Elizabeth Orthopædic Hospital, Exeter, for giving children the benefit of sea air; £500 each to the Miners' Hospital at Redruth, the Devon and Exeter Hospital, and the Home for Incurables, Exeter; £250 each to the Camborne District Nursing Association, the Exeter Dispensary, and the Devonshire Nursing Association.—Mr. Morris Marians, Rodney Court, Maida Vale, left £1000 to the Home and Hospital for Jewish Incurables, £500 to the London Hospital for the Jewish Ward, and £250 each to the Jewish Board of Guardians, and the Jews' Hospital and Orphan Asylum.—Mr. William John Fieldhouse, C.B.E., J.P., Austy Manor, Wooton Waven, Warwick, left £500 each to the Children's Hospital, Birmingham; the General Institution for the Blind, Birmingham; the General Hospital, Birmingham; and the Stratford-on-Avon Hospital.

CARDIFF MEDICAL STUDENTS' CLUB (LONDON BRANCH).—This club inaugurated its London branch at a successful dinner held on St. David's Day (March 1st) at Frascati's Restaurant. Dr. Dan Davies presided over a gathering of some 50 former students of the school, who were continuing their clinical studies at various London hospitals owing to the closure of the Cardiff Royal Infirmary to students. The chairman, proposing the toast of Dewi Sant, said that the study of the early history of the University of Wales, its struggles and its successes, could not fail to deepen the patriotism of young Welshmen. The life and work of Viriamu Jones should be familiar to all graduates of the University. Other universities had prospered through benefactions from the rich, but the University of Wales had been built up largely from the contributions of the peasantry. There had been some movement in the large towns of Wales in favour of the establishment of local universities; the breaking up of the Federal University of Wales would, in his view, be a retrograde step. Prof. E. H. Kettle, of St. Bartholomew's Hospital, proposed the Welsh National School of Medicine. He expressed a profound faith in the future of the school and regarded the gathering that evening as a gesture of belief and pride in the school on the part of the younger generation. He had reluctantly been forced to the conclusion that the ideals which had inspired those who had worked for the development of a great national school had been forsaken, and that envy, selfishness, and pettiness of vision had resulted in a real tragedy—the eclipse of the school. He trusted that the eclipse would only be temporary, but it must be remembered that the school could not rise again without financial assistance from the Government, and no money was likely to be forthcoming unless substantial guarantees were given that the deplorable situation of last year would not again arise. Mr. W. D. Lovelock-Jones, in seconding, expressed the sincere hope that Welsh nationalism would demand the resurrection of the school. Prof. A. W. Sheen, responding, said that negotiations were still in progress. The students who had not finished their studies were anxious to return to Cardiff, and he trusted that by next October the school would be re-established. Prof. A. M. Kennedy, who also replied, was less optimistic. He had been impressed by the loyalty of the students in Cardiff to the professors, and would like to see a great Welshman take the position in hand. Mr. E. Llewellyn Williams and Mr. D. C. Harris proposed the health of the professors, and Prof. E. L. Collis replied in g ni l vein. The toast of the Cardiff Medical Students' Club was given by Mr. J. P. G. Howells, Miss M. E. H. Jones seconding Prof. T. Graham Brown, as president of the club, conveyed greetings from the junior students working in Cardiff. Sir Ewen Maclean, when proposing the Guests, referred to the exigence of the requirements of the University of London. It was hardly reasonable to insist, as a condition of recognition, that every member of the hospital staff should accept responsibility for teaching. The final toast of the Chairman, proposed by Mr. Lambert Rogers, was acclaimed with musical honours.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 11th.—5 P.M., WAR. Paper: Surg.-Commdr. Horace Hill, R.N.: Post-encephalitis and its Problems in the Service.

TUESDAY.—5 P.M., THERAPEUTICS. Communication: Dr. G. Linder and Dr. C. F. Harris: Treatment of Chronic Tetany with Steatorrhœa in Adults. 4.30 P.M., PSYCHIATRY. (Tea will be provided at 4 P.M.) Clinical Meeting at the Maudsley Hospital, Denmark Hill, S.E. Cases will be shown illustrating Neuroses and Psychoses of Childhood.

THURSDAY.—5 P.M., BALNEOLOGY. Paper: Dr. J. F. Halls Dally: The Spas of Switzerland. Discussion on Diathesis in Arthritis. Opener: Dr. H. A. Ellis. To be followed by Dr. E. P. Poulton and Dr. E. Obermer. 8.30 P.M., NEUROLOGY. Cinematograph Demonstration of a film showing work on "conditioned reflexes" in Prof. Pavlov's Laboratory, Leningrad. N.B.—Admission will be by ticket only. Applications for tickets should be addressed to the Secretary, Royal Society of Medicine.

FRIDAY.—8 P.M., OBSTETRICS. Joint Meeting with the Maternity and Child Welfare Group of the Society of Medical Officers of Health. Discussion on the Future of the Maternity Services. Openers for the Section of Obstetrics: Prof. J. M. Munro Kerr, Mr. Eardley Holland. Openers for the Society of Medical Officers of Health: Dr. Eustace Hill (M.O.H., Co. Durham), Dr. J. J. Buchan (M.O.H., Bradford). 8.30 P.M., ELECTRO-THERAPEUTICS. Paper and Demonstration: Dr. W. S. Whitcombe: Intensive Ionisation. Paper: Dr. A. B. MacLean (Glasgow): The Prone Position as a Routine Method in the X Ray Examination of the Stomach, with a note on the question of Retractability of the Stomach. (Illustrated by lantern slides.)

BIOCHEMICAL SOCIETY.

FRIDAY, March 15th.—4.30 P.M. (in the Department of Physiology and Biochemistry, University College, Gower-street, W.C.). Communications: I. Smedley MacLean: Further Observations on the Sterols of Yeast. H. J. Channon and A. C. Chibnall: The Isolation of N-Nonacosane and Di-n-Tetradecyl Ketone from Cabbage Fat. J. G. Davis and A. T. R. Mattick: The Metabolism of a Pigmenting Anaerobic Bacterium. G. N. Richardson and R. K. Cannan: Reaction of Azine Compounds with Proteolytic Enzymes. B. C. Guha and J. C. Drummond: Observations on the Concentration of Vitamin B1. J. C. Drummond, R. A. Morton, and K. H. Coward: A Critical Examination of the Methods for the Assay of Vitamin A. C. R. Harington and S. S. Randall: Isolation of 3:5-Diiodotyrosine from the Thyroid Gland.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, March 11th.—8.30 P.M., Discussion on the Chronic Dyspepsias of Children over the Age of Infancy. To be introduced by Dr. R. Miller, followed by W. G. Wyllie.

HARVEIAN SOCIETY, Town Hall, Paddington Green.

THURSDAY, March 14th.—8.30 P.M., Dr. E. Graham Little: The Medical Profession, the Voluntary Hospitals, and the De-rating Bill. (Harveian Lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, March 12th.—5 P.M., Prof. E. B. Verney: Polyuria. (Second Goulstonian Lecture.)

THURSDAY.—5 P.M., Prof. E. B. Verney: (Last Goulstonian Lecture).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, March 11th.—5 P.M., Mr. C. E. Shattock: Specimens Illustrating Disease of the Kidneys.

FRIDAY.—Prof. Sir Arthur Keith: Recent Advances in Our Knowledge of the Anatomy and Physiology of the Gall-bladder.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, March 11th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Some Disorders of Sleep.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Martin: Disorders of Sensation.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Bailey: Muscular Paresis and its Electrical Treatment.

FRIDAY.—12 noon, Dr. Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Neurological Complications of Acute Specific Fevers.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE. (Intensive Course, First Week, 10.30 A.M. to 5.30 P.M.)

MONDAY, March 11th.—Dr. Harold Pritchard: Processes of Excretion, with special reference to the Renal Function. Mr. Donald Armour: Head Injuries (Lecture I.) Sir Henry Simson: Meddlesome Midwifery. Dr. H. E. Archer: The Chemical Investigation of Pancreatic and Hepatic Function. Dr. J. Burnford: Glycosuria.

TUESDAY.—Dr. M. E. Shaw: Peptic Ulcer. Dr. Grainger Stewart: The Diagnosis of Intracranial Tumours. Mr. Tyrrell Gray; Surgical Ward Cases. Mr. Sangster Simmonds: The Treatment of Injuries, illustrated by cases (Lecture I.). Dr. Scott Pinchin: The Use of Artificial Pneumothorax and Lipiodol in the Diagnosis and Treatment of Pulmonary Disease (Lecture I.).

WEDNESDAY.—Dr. Carter Braine: X Ray Therapy (case demonstration). Mr. Neil Sinclair: Demonstration of Surgical Cases. Mr. O. L. Addison: Diagnosis of Tumours of the Breast. Dr. Redvers Ironside: Clinical Demonstration on Endocrine and Metabolic Disorders (Demonstration 1). Mr. Sangster Simmonds: Demonstration of Splints Used in the Modern Treatment of Fractures.

THURSDAY.—Dr. S. A. Owen: Diseases of the New Born, including Intracranial and other injuries, Hæmorrhage, Jaundice, Heart Disease. Mr. Donald Armour: Head Injuries (Lecture II.). Mr. Vlasto: Vertigo. Mr. Bishop Harman: The Three "Pink Eyes," Conjunctivitis, Iritis, and Glaucoma. Mr. S. G. MacDonald: Urological Problems (Lecture I.).

FRIDAY.—Dr. Scott Pinchin: The Use of Artificial Pneumothorax and Lipiodol in the Diagnosis and Treatment of Pulmonary Disease (Lecture II.). Dr. G. B. Dowling: Protein Sensitisation in Relation to Skin Diseases (First Lecture: Urticaria). Dr. Harold Pritchard: The Advantages and Indications for Intravenous Methods of Treatment. Dr. Redvers Ironside: Clinical Demonstration on Endocrine and Metabolic Disorders (Demonstration 2). Mr. F. C. Endean: The Modern Treatment of Syphilis.

SATURDAY.—Dr. R. R. Elworthy: Laboratory Values (Lecture I.). Mr. F. St. J. Steadman: Oral Sepsis in Relation to General Disease.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, March 11th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, March 11th, to SATURDAY, March 16th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., at 5 P.M., Lecture by Dr. F. W. Price: Pitfalls in Cardiology.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M., Demonstration by Dr. W. J. O'Donovan: The Treatment of Skin Diseases by Light Therapy, Indications and Limitations.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W. Thurs., at 11 A.M., Clinical Demonstration by Mr. S. L. Higgs.—THE INFANTS HOSPITAL, Vincent-square, S.W. Thurs., at 4 P.M., Dr. Eric Pritchard: A clinical demonstration of cases illustrative of the difficulties arising in connexion with digestive disturbances in infants. The above are free.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W. All-day course.—ROYAL EYE HOSPITAL, Southwark, S.E. Afternoon course. Further particulars from the Secretary.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Endsleigh-gardens, W.C.

MONDAY, March 11th, and TUESDAY and WEDNESDAY.—5.30 P.M., Prof. F. Fülleborn: Some Questions of Tropical and Local Helminthology.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, March 12th.—3.15 P.M., Mr. J. B. Hunter: Appendicitis.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, March 14th.—4 P.M., Dr. Poynton: On Virus Diseases.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, March 12th.—5 P.M., Dr. J. E. M. Wigley: Leukæmia Cutis, Mycosis Fungoides.

THURSDAY.—5 P.M., Dr. J. E. M. Wigley: Pemphigus and Allied Eruptions.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, March 11th.—5 P.M., Mr. P. Eggleton: The Chemistry of Muscle Contraction.

NATIONAL COUNCIL FOR MENTAL HYGIENE, 78, Chandos House, Palmer-street, S.W.

WEDNESDAY, March 13th.—5 P.M. (at the Medical Society of London, Chandos-street, W.), Sir Maurice Craig: The Problem of Nervous Breakdown.

ANCOATS HOSPITAL, POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, March 14th.—4.15 P.M., Mr. Harry Platt: Sciatica.

MEDICAL SCHOOL, Leeds.

WEDNESDAY, March 13th.—3.30 P.M., Mr. Cecil Rowntree: Cancer and the General Practitioner.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, March 15th.—3.30 P.M. (at the Royal Hospital), Mr. F. Wilson: Clinical Cases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, March 12th.—4.15 P.M., Dr. C. H. Melland: The Use and Abuse of Aids to Diagnosis.

FRIDAY.—4.15 P.M., Mr. C. Roberts: Demonstration of Surgical Cases.

Appointments.

WITTS, L. J., M.D. Manch., has been appointed Fifth Assistant Physician to Guy's Hospital.

Certifying Surgeons under the Factory and Workshop Acts: MILNE, C. I., M.D., Ch.B. Edin. (Hanley, Stafford); WHYTE, VENABLES, H. A., M.B., B.Chir. Camb. (Pulborough, Sussex).

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—H.S. At rate of £100 to £150.

Ashton-under-Lyne, District Infirmary.—Res. Surg. O. At rate of £200.

Barrow-in-Furness, North Lonsdale Hospital.—H. S. £150.

Bath, Royal United Hospital.—H.S. Also Asst. H.S. At rate of £150 and £100 respectively.

Bedford, Bedfordshire Sanatorium.—Res. Asst. M.O. £400.

Bedfordshire County Council.—Asst. M.O. £600. Also Asst. County Dentist. £450.

Birmingham, Ear and Throat Hospital.—2nd and 3rd. H.S. Each at rate of £150.

Birmingham General Hospital.—Surg. Cas. O. £400.

Brentwood Mental Hospital.—Jun. Asst. M.O. £510.

Bristol City Mental Hospital.—Third Asst. M.O. £300.

Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.

Cancer Hospital, Fulham-road, S.W.—Anæsthetist.

Cardiff, City Mental Hospital, Whitchurch.—Research Chemist. £800.

Cardiff, North Wales Sanatorium, Llangwyfan, near Denbigh.—Third Asst. Res. M.O. £250.

Chester, East Lancs. Tuberculosis Colony, Barrowmore Hall, Great Barrow.—Asst. M.O. £250.

City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.

Coventry and Warwickshire Hospital.—Res. H.P. £125.

Croydon, Mayday-road Hospital.—Res. Asst. M.O. £300.

Derby, Derbyshire County Sanatorium, near Chesterfield.—Res. Asst. M.O. £350.

Dreadnought Hospital, Greenwich, S E.—H.P. and H.S. Each at rate of £110.

Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.

Durham County Council and Chester-le-Street Urban District Council.—District Tuberculosis M.O. and M.O.H. £700.

Eastbourne, Princess Alice Memorial Hospital.—Jun. H.S. At rate of £100 to £150.

Gloucester, Gloucestershire Royal Infirmary.—Second H.S. At rate of £100.

Grimsby County Borough.—Asst. School M.O. £600.

Hastings, Royal East Sussex Hospital.—Pathologist. £200. Also M.O. to V.D. Department, £375. Also Hon. Asst. Physician.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also H.S. and H.P. At rate of £100.

Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O. £200.

Isleworth, Warkworth House Institution and Scattered Homes.—Asst. Med. Supt. &c., £450.

Kensington, Fulham and Chelsea General Hospital, 194, Fin-borough-road, S.W.—Hon. Phy. for Dis. of Skin.

L.C.C. Mental Hospital Service.—Eighth Asst. M.O. £300.

Malayan Medical Service.—Bacteriologist, £700.

Manchester, Salford Royal Hospital.—H.S. to Orthopædic Dept. Also H.S. Each at rate of £125.

Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.

Manchester Babies Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Metropolitan Ear, Nose and Throat Hospital, Fitzroy-square, W.—H.S. £150.

Miller General Hospital, Greenwich-road, S.E.—Hon. Asst. Dental S. 30 gns.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. At rate of £150.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Anæsthetist. £20. Also Hon. Dermatologist.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80 to £100.

Richmond, Surrey Royal Hospital.—Sen. H.S. Also Jun. H.S. At rate of £150 and £100 respectively.

Royal Free Hospital, Gray's Inn-road, W.—Cas. Officer. £150.

Royal National Orthopædic Hospital, 234, Great Portland-street, W. Hon. Asst. S.

Royal Northern Hospital, Holloway, N.—H.P. Also Obstetric H.S. Each at rate of £70.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Surgical Registrar.
St. Thomas's Hospital, S.E.—Asst. Surgeon in Orthopædic Dept.
Salisbury General Infirmary.—Two H.S.'s. Each £150.
Salop County Council.—Asst. M.O. £600.
Sheffield Royal Infirmary.—Hon. Asst. Surg.
Swansea Hospital.—H.S. £150.
Walsall General Hospital.—Sen. H.S. Also Jun. H.S. At rate of £200 and £100 respectively.
West London Hospital, Hammersmith, W.—H.P. Two H.S.'s. Each at rate of £100. Also Non-Res. House Officer. £5 5*s.* weekly. Hon. Asst. Anæsthetists.
Western Ophthalmic Hospital, Marylebone, N.W.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.
Western Skin Hospital, 44, Hampstead-road, N.W.—Hon. Asst. Dermatologist.
Worksop, Victoria Hospital.—H.S. At rate of £170.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons :—Hereford Market Deeping (Lincs.), Kinross, Tredegar (Mon.).

Births, Marriages, and Deaths.

BIRTHS.

BRETTELL.—On Feb. 24th, at Heath-terrace, West Bromwich, Staffs, the wife of Harry Macduff Brettell, L.D.S., of a daughter.

MARRIAGES.

CRADDOCK—JOYCE.—On March 2nd, at St. Mary's, Paddington, Stuart Craddock, M.B., B.S., M.R.C.S., L.R.C.P., to Lilian Margaret Meath Joyce.
RYAN—RICKARDS.—On Feb. 28th, at St. James's, Spanish-place, W., Joseph Ernest Noel Ryan, T.D., M.D., to Dulcie, only daughter of the late Lionel E. Rickards.

DEATHS.

BURTON.—On March 3rd, at Lee Park Lodge, Blackheath, S.E., Herbert Campbell Burton, L.R.C.P., M.R.C.S.
CRASTER.—On Feb. 27th, at Keston House, Keston, Kent, Herbert Vaughan Craster, L.R.C.P., L.R.C.S.
EVILL.—On March 3rd, at Warwick-gardens, Worthing, Dr. Frederick Claude Evill, of The Lodge, High Barnet.
HILL.—On Feb. 27th, at Granta, Upper Bassett, Southampton, Alex Hill, M.A., M.D., F.R.C.S., F.R.C.P.
MACKENZIE.—On March 2nd, at Upper Brook-street, Sir Hector W. G. Mackenzie, M.A., F.R.C.P., aged 72.
TURNER.—On March 2nd, at Bury-road, Alverstoke, Hants, Robert Turner, late Deputy Inspector-General of Hospitals, Royal Navy.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

LEEDS WORKPEOPLES' HOSPITAL FUND.—Last year this fund raised £44,560, the largest sum on record. There are 144,000 contributors, and the workshop collections amounted to £36,495. The Leeds General Infirmary, to which £23,677 has been allocated, issued five million doses of medicine to out-patients in the course of the year.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Case Committee 40 applications were considered and 36 grants were voted amounting to £744 3*s.* The following is a résumé of four cases :—

Daughter, aged 46, of M.D. Left penniless on the death of her father, and in spite of delicate health, trained as a nurse. She broke down badly after working at a hospital during the war, and though she bravely attempted to resume work later, was ultimately forced to give it up. She is now suffering from tuberculosis. There is no relation who can help. The Fund voted £36 towards the sanatorium fees, and with this as a start a gentleman who knows and admires this lady's uphill fight throughout her life is personally endeavouring to raise a special fund so that treatment in the sanatorium can be continued.

Daughter, aged 25, of L.R.C.P. Is suffering from tuberculosis and every hope is held out of a cure by immediate treatment. The applicant, however, has no private means to enable her to do this. Fund voted £25, and with the coöperation of the Guild enough money has been raised for one year's treatment.

Widow, aged 57, of M.R.C.S. Her husband died in January, 1929, having been mentally deranged for the last years of his life. During these years his wife had had to attend her husband, and on his death such little income they had, amounting to £117 per annum, ceased. Her brother is able to contribute £26 per annum. Being an energetic and capable woman it is hoped that after she has had time to recover her health, which has been badly broken by all she has had to suffer, she will be able to find work and fend for herself. To give her the necessary rest and opportunity to find work the Fund voted £28 towards her maintenance.

Widow, aged 60, of M.B., whose husband died in November, 1928. After everything is settled and debts are paid the income which she may hope to receive from her husband's estate will be 15*s.* a week. Voted £30 in four instalments. Her total income will then be only £69 a year, but she hopes she may find some lodgers to take into her home and thus augment her ncome.

Notes, Comments, and Abstracts.

THE EFFECTS OF MUSIC UPON THE HUMAN BLOOD PRESSURE.

BY SWALE VINCENT, M.D. LOND., D.SC. EDIN., LL.D.,
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF LONDON;
AND
J. H. THOMPSON, B.SC.,
DEMONSTRATOR IN THE DEPARTMENT OF PHYSIOLOGY, MIDDLESEX HOSPITAL MEDICAL SCHOOL.
(*From the Department of Physiology, Middlesex Hospital.*)

THE effects of music upon the human organism have naturally received a certain amount of attention, but comparatively few exact observations have been made upon the circulatory system.

In 1914, Vincent, Cameron, and Armes [1] contributed to the Royal Society of Canada a paper upon the effects of music upon the blood pressure, and reported certain changes as measured with a Rogers's sphygmomanometer. They employed simple tones (single notes, scales, arpeggi) as well as more elaborate pieces of music. The latter consisted of piano pieces by various composers, songs with piano accompaniment rendered by amateur and professional performers, and various compositions played by a full symphony orchestra. They classified their subjects into three groups : (*a*) musical, (*b*) moderately musical, (*c*) non-musical. In a musical person they found that the effect of a quiet uneventful composition is a steady lowering of the blood pressure, but they recognised that this might be largely a rest effect. When the music was of greater interest and possessed a liveliness dependent on rapid movement, intensity of tone, discords, sudden changes of key, &c., they usually obtained rises of blood pressure. They also found that if the music was of such a kind as to arrest severely the attention of a musical individual, the effect might be a fall, and this they thought was the result of altered respiration. They found that singing produces less effect than piano-playing, and that the effect of a full orchestra is not different from a piece played on a piano, except that the nature of the composition would be different in the two cases. With moderately musical and non-musical people they found that the principal difficulty is to find compositions which to them will be of sufficient interest to produce any effect. These observers thought it possible that there is a relation between the reaction time and the impressionability to music, and they discussed the action of musical stimuli in producing changes of blood pressure.

In general, they concluded that musical interest would give a rise of blood pressure, whilst absence of such interest would be without effect. It will be seen that these do not quite coincide with our present results.

Method of Observation.

During the past few months we have been employing an instrument of which preliminary descriptions have been given [2] for recording various influences upon the human blood pressure. Briefly, the Thompson sphygmanograph consists of a modified water manometer connected to a special armlet whereby it becomes possible to record variations in blood pressure over long periods of time without causing any discomfort to the subject.* It was obviously a matter of great interest to experiment with musical stimuli and to compare the results with those obtained by the older methods.

There is another difference between our experiments and those of Vincent and his earlier co-workers. While the latter employed " real " music, we have confined our attention to the effects of reproduced music. This is a matter of some importance, as such music is much commoner than in 1914, and large numbers of people listen to very little else in a musical direction.

We have to express our best thanks to the Marconiphone Co., for the use of a super 8-valve wireless receiver ; to the Gramophone Co. for the use of " His Master's Voice " gramophone model No. 202 and a large selection of records ; and to the Columbia Gramophone Co. for some interesting records.

There are many reasons for supposing that the results produced in a concert room are likely to be very different from those brought about by listening to a gramophone

[1] By means of specially constructed armlets it is now possible to record over unlimited periods of time without causing venous congestion. The effects of muscular movements upon the pressure system have been also eliminated.

or a wireless loud-speaker. There is naturally an excitement of a special kind which must accrue when one is in the actual presence of the performers and the rest of the audience. We venture to suggest also that, since there is so much more music at the present date than in 1914, people have become to a certain extent immune to its effect. This is corroborated by the observation that, with some notable exceptions, professional musicians are not as much affected by music as musical amateurs. The best type of subject is undoubtedly a musical amateur of good taste and emotional susceptibility, who can, and habitually does, enjoy music in a naïve manner without the exercise of too much critical faculty.

Then, of course, there are corresponding difficulties with the type of music selected for the experiment. It is not to be expected, for example, that a musically sophisticated person will be roused to any very great emotion by the rendering of a Strauss waltz, even if he hears it direct from Vienna! On the other hand, it is not much use to try Holst's "Planets" on a gentleman who can go into raptures over "The More we are Together."

The actual volume of sound which reaches the ears is obviously a matter of great importance. We are unable to state at the present time whether, when one sits near to a full-sized gramophone and hears an orchestral reproduction, the volume of sound and degree of stimulation are greater or are less than when hearing the same composition in the Queen's Hall. There seems to be no readily available method of measuring volume of sound.

We have made every effort to surmount these difficulties, and we have, we think, obtained some results which are of interest.

We have found that it is essential that the subject should remain seated in a comfortable position for some few minutes before listening to the music. During this period there is a slight fall of blood pressure in perhaps the majority of subjects, and in a small number a slight rise. The actual result will depend upon the degree of the preliminary activity or excitement. In the present series of experiments we have not found that increase of emotional effect is necessarily concomitant with a rise of blood pressure. It seems to be the case that sometimes there will be a rise and sometimes a fall, and either one or other of these occur, whatever was the initial height of the original blood pressure.

Experiments Involving the Use of a Wireless Receiving Set.

The receiving set and operator were shielded from the subject's view by a screen, and the loud-speaker placed about six feet behind the subject. Many of the experiments were spoilt by morse, "atmospherics," and impulses from electrical machines in the neighbourhood. All such experiments were discounted for the purpose of this investigation, since the subjects were unable to concentrate their attention upon the actual music. Only those experiments in which music reproduction was good and without interruption have been used in the analysis of the results.

Wireless Results.

—	Musical group.	Moderately musical group (m.m.g.).	Non-musical group.
Volume	No effects.	Increase of volume = { interest—fall. no interest—rise.	Same as m.m.g.
Melody	Fall.	Slight fall.	No effect.
Pitch	—	High pitch = { interest—rise. no interest—fall.	—
Rhythm	—	Slight fall.	? Rise.
Beginning	Rise.	—	Rise.

Musical Subjects.—It was found that with musical subjects volume changes produced small effects upon the blood pressure. It was possible to vary artificially the volume within a very considerable range, and also to produce loud and sudden noises, but in no case did the variation in volume cause any marked disturbance of blood pressure in this group. In striking contrast, however, were the effects obtained by changes in melody and rhythm, particularly melody. In some instances it was possible to gauge the emotional content of the music by means of the blood pressure tracing! A change from an "amorphous" type of music to a melody pleasing to the subject almost invariably was accompanied by a marked fall in blood pressure. The same phenomenon was noted when a pleasant melody occurred several times in the same piece. Similar results of less degree occurred with changes of rhythm.

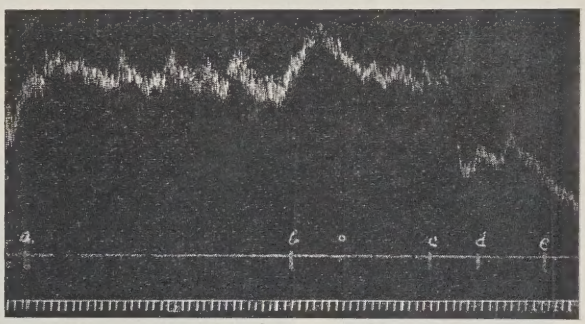
The chief characteristic of this group is a fall of blood pressure. The only occasion when small rises of blood pressure were obtained was at the commencement of the music. That this was an effect due to the music is verified by the control experiments in which "musical" subjects submitted to a "rest" experiment as above described. All such subjects gave slow gradual falls of blood pressure commencing at the onset of the experiment. Anticipation of the music by the subject can also be excluded because "dummy" experiments gave results identical with "rest" experiments.

It was impossible to analyse the effects of appreciation * of the music heard by these persons because not one of the ten members of the group fully appreciated any musical item of the experiments. In all cases the "unreality" of reproduced music appeared to antagonise appreciation. Symphonic music gave the greatest falls of blood pressure, chamber music slight falls, dance music was without effect, and military bands (which came through very well) showed small rises. Symphony music, therefore, conformed most to the characteristic effect of this group.

Moderately Musical Group.—Onset of music caused small rises in blood pressure and cessation was coincident with a corresponding fall. The fall at the conclusion was most marked when the music was full of interest to the subject. Volume effects were obtained with all subjects in this group. The effects were well-defined. When the music was not interesting, increase of volume caused a fall of blood pressure, and decrease of volume a rise of blood pressure. When interest in the music was taken, increase of volume produced a rise of blood pressure, and decrease of volume a fall of blood pressure (Fig. 1).

A unique characteristic of this group as compared with the other two groups was the effects of the pitch of the music. Again, this factor and interest were co-related. When the music was not interesting a high-pitched note, or series of notes, brought about a fall in blood pressure, whilst the same notes when there was full interest, caused a rise of blood pressure. Changes in melody and rhythm showed variations in blood pressure comparable to those obtained in the musical group, although they were much smaller. The general effect upon the blood pressure was therefore very small in this group, although the tracings were markedly irregular, due to fluctuation in interest, volume, and pitch. Chamber music and dance music showed little general effect, symphonic music resulted in continued rises of blood pressure, whilst singing caused marked falls. Chamber music in particular exhibited the type of tracing most often obtained from this group.

FIG. 1.



Effect of volume on moderately musical subject: (A) commencement, (B) increased volume, (C) decreased volume, (D) increasing volume, and (E) end.

Non-Musical Group.—Detailed changes in the music were practically without effect in this group of individuals. Volume changes were slight, and were of the same type as those in the "moderately musical" group. Pitch and melody failed to produce any characteristic changes in blood pressure. There were marked initial rises of blood pressure, but no terminal effects were observable. In nearly all cases, however, there was a steady rise of mean blood pressure throughout the experiment. All the eleven subjects in this group were interested keenly in "wireless," and possibly it was this interest in the reception which caused the continued rise of blood pressure. Control experiments failed to show such rises.

Symphonic music produced slight falls of blood pressure, chamber music and singing showed either slight falls or were without effect, and dance music invariably gave considerable and continued rises of blood pressure. Dance music thus becomes the type of music which most easily elicits the characteristic blood-pressure record of this group.

* "Appreciation" is used to mean an intelligent comprehension of the aims of the composer, and an enjoyment of the total effect produced.

Experiments Involving the Use of a Gramophone.

The experiments involving the use of a gramophone were conducted under conditions identical with the last series of experiments. For the purposes of analysis, subjects were again divided into the three groups—musical, moderately musical, and non-musical. A large number of persons were examined, and owing to the large selection of records kindly lent to us, it was possible to try the effects of various types of musical composition upon each person.

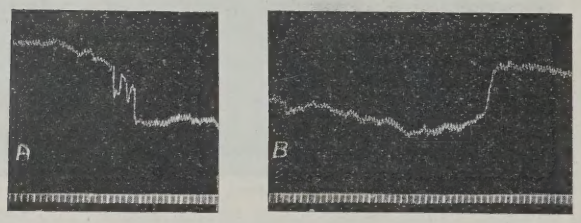
Gramophone Results.

—	Musical group.	Moderately musical group.	Non-musical group.
Volume	Loud = fall. Soft = no rise.	Loud = small fall. Soft = no rise.	No effect.
Melody	Rise.	Slight rise.	,,
Pitch	High pitch = rise.	Change to high pitch = small rise.	,,
Rhythm	—	Increase = rise. Decrease = fall.	Fall in one subject.
Beginning	Fall.	—	—

Musical Group.—The reactions of subjects in this group were very well marked. The variations in blood pressure were considerable and frequent whenever the music was of the type which was appreciated by these subjects—namely, the "classical" type.†

The majority of people exhibited a marked fall of blood pressure coincident with the commencement of music, except in the case of vocal music, when the fall was replaced by a rise (Fig. 2). Conclusion of music resulted in a slow recovery process. Members of this group were very

FIG. 2.



A = Commencement of instrumental music showing depressor effect in a musical subject.
B = Commencement of vocal music showing pressor effect in the same subject.

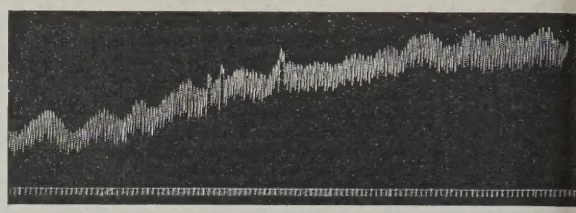
responsive to all kinds of differences in the music, provided there was appreciation. Volume effects were always present, loud tones producing considerable and immediate falls of blood pressure. A striking feature of this group was the rapidity of response, the latent period being much smaller than in the other two groups.

Careful analysis of a large number of experiments has shown that whereas loud tones produce falls of blood pressure, soft tones do not cause rises of blood pressure. Soft tones allow recovery from a previous fall due to increased volume to take place, but no rise above the original mean occurs although the decreased volume persists. It seems reasonable to infer, therefore, that mere volume of sound causes depressor effects which become increasingly obvious as the volume increases. Usually, of course, many other factors mark this effect by superposition. Thus, in this particular group, changes in melody were potent means of varying the blood pressure. Changes in melody such as occur in Beethoven's "Moonlight Sonata," caused rises of blood pressure in subjects of this group, and these rises were largest when the melody was played softly (Fig. 3). The fact that rises were invariable with melodies appreciated by the subjects even when rendered fortissimo is indicative of the greater potency of melody as compared with volume.

Differences in pitch also showed effects. That these effects were caused by contrast is shown by the many experiments in which transition from a very low pitch to a high one, and vice versa, were coincident with a rise and fall of blood pressure respectively. But maintenance of notes of high pitch did not cause a progressive rise of blood pressure, nor did notes of low pitch produce a fall of blood pressure. Effects due to pitch were largely swamped by volume effects. Thus large falls were recorded, when the pitch fell with increasing volume but under similar conditions with decreasing volume, the above-mentioned recovery process still occurred although somewhat more gradually.

In relation to the kinds of music used in these experiments it is interesting to note that all members of this group gave rises of blood pressure with vocal music. Even the initial fall characteristic of this group was superseded by a rise of blood pressure where vocal music started at the beginning of the experiment. When there were a few preliminary bars of instrumental music the usual fall occurred, but was

FIG. 3.



Continued rise of blood pressure in a musical subject whilst listening to Beethoven's "Moonlight Sonata."

immediately checked and a rise began when singing commenced. It is interesting to note that the solo flute appears to have a similar effect. Symphonic music and good chamber music elicited most response, whilst dance music gave very little variation in the tracing.

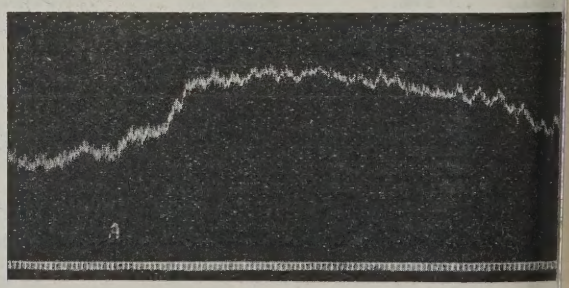
The general effect upon the blood pressure in this group was a fall of blood pressure. A small minority of subjects showed a higher pressure at the end than at the beginning. It is to be noted that all the persons were of an emotional type, and were easily excited by music. Thus, in one instance, the subject became pallid, developed muscular twitchings, and showed signs of intense emotional excitement when listening to the second part of the overture to "Oberon" by Weber.

Previous knowledge of the piece of music does not appear to alter the results in any way. The determining factor is appreciation. So long as the subject appreciates the music played, so long do all the above-mentioned phenomena occur. Non-appreciation always results in a slow gradual fall without variations.

Moderately Musical Group.—Subjects in this group were like members of the previous group, very responsive when the music was appreciated. But "appreciation" in this group really means "interest" when applied to this group—that is to say, it was necessary in order that effects could be produced for the subject to derive definite pleasurable interest from the music, rather than to find an intellectual appreciation therein. Consequently we encountered the same difficulty as Vincent and Cameron—namely, finding music compositions of sufficient interest to produce any effect.

Volume, pitch, and melody exerted an influence comparable to that in the musical group, but in lesser degree.

FIG. 4.



Showing the effect of the substitution (A) of comic opera (Gilbert and Sullivan) for pianoforte music upon a moderately musical subject.

Moreover, rhythm showed well-marked results. Increased rhythm caused a rise of blood pressure, and decreased rhythm a fall, other factors remaining constant. Rhythm swamped volume and pitch, but was subservient to melody.

Symphonic music produced chiefly slow unvaried falls and dance music had little effect apart from rhythm and association. Popular music like Gilbert and Sullivan comic operas gave best results (Fig. 4). Such music had little influence with the musical subjects, but with members of this group the detailed variations of blood pressure were

† The word "classical" is not used here in its strictest sense, but (in accordance with popular usage) simply means music which is considered worthy of attention by competent musicians.

as pronounced as those obtained in the musical group with symphonic music. There was one notable difference, however—commencement of music was coincident with a rise of blood pressure.

Non-musical Group.—Although a large number of subjects were examined in this group, in not a single instance was a rise of blood obtained. The general effect was a slow uneventful fall of blood pressure commencing with the onset of music and continuing for a short while after cessation of music. Lively and unusual music provoked a smaller gradient fall, whilst quiet melodious music, particularly pianoforte, elicited more rapid falls.

One subject was included in this group who entirely failed to be interested in any kind of music except "jazz." His pleasure in hearing "jazz" was probably not a musical emotion at all. The effect of a foxtrot well-known to him was to cause a large and sudden fall of pressure which was augmented by the predominance of the saxophone part. After the experiment he described his keen enjoyment of the music by the expression: "I could hardly keep still and wanted to dance."

Discussion.

From a purely musical standpoint, the wireless experiments upon the musical and non-musical groups must be discarded, since in the former group there was complete absence of appreciation, and in the latter group the effects were mainly due to an interest in the wireless reception itself. There was true musical interest and some appreciation in the moderately musical group in both sets of experiments, and it will be observed that the results obtained are remarkably similar. In both series these subjects showed initial rises, with variations corresponding to melody, rhythm, pitch, and volume, the volume effects being dependent upon appreciation of music.

The most well-defined and greatest effects are always obtained with members of the musical group when the music is of a kind they are able to appreciate. The more nearly "real" the music is, the more obvious are these results. Hence, in this particular investigation, there was more response with the gramophone than the wireless when applied to the musical subjects. Conversely, the smallest variations of blood pressure occur in the non-musical group. As already stated, the characteristic rise shown by this group whilst listening to music reproduced by a loud-speaker is probably due to interest in the wireless, since substitution of the loud-speaker for a gramophone causes the characteristic of the groups to become a fall of blood pressure.

The predominant factor is appreciation or interest, and not the type of music, as seems to be imagined by most workers. For example, J. D. Hyde [3] concludes that Tschaikowsky's "Symphonie Pathétique" unfavourably affects listeners by lowering the blood pressure, &c. But our investigations clearly demonstrate that the moderately musical person who appreciates the symphony experiences a rise of blood pressure. Volume, too, is a most important factor. If the symphony be played very loudly the rise may be converted into a slight fall, or at any rate the rise will be diminished.

Helda Eng [4] has tabulated many results according to appreciation or not. Records of the respiration were taken during the experiments, and in all the experiments variations in depth and rate of respiration were found. Vincent and Thompson [5] have shown that in all subjects with pulse-rates above 65 per minute that increased respiration is coincident with falls of blood pressure. Further experiments alone recently have also demonstrated that diminished respiration causes slight rises of blood pressure. In view of these results it is significant that in all instances in which Helda Eng obtained falls of blood pressure she also obtained increased respiration, and conversely with rises of blood pressure diminished respiration.

We also have recorded respiration during the foregoing experiments and found that occasionally the respiration was affected, and was the cause of some of the variations of blood pressure. All such results have been eliminated and only those used for analysis which showed no alteration in the respiratory record. When marked respiratory variations occur they are nearly always coincident with obvious emotional excitement. The greater the emotional stress the more marked are these variations.

A. S. Warthin [6] obtained very large differences, both in rate and depth in respiration, when he tried the effect of music upon hypnotised subjects.

We have to express our thanks to Dr. Agnes Savill for some references to literature, and for providing subjects for experiments.

Summary.

Continuous records of human blood pressure have been taken showing the effects of reproduced music upon it.

Subjects were grouped into three sets—musical, moderately musical, and non-musical. Each group was found to respond differently in relation to variations of volume, melody, rhythm, pitch, and type of music.

Intelligent comprehension of, and interest in, the music were important determining factors in the first two groups. Melody produced the most marked effects in the musical group, while volume effects were most apparent in the moderately musical subjects.‡

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3. Hyde, I. D.: Effects of Music (Ed. Max Schoen), London, 1927, p. 184.
4. Eng, Helda: The Emotional Life of the Child, London, 1927.
5. Vincent, S., and Thompson, J. H.: Jour. Physiol., 1928, lxvi., 307.
6. Warthin, A. S.: Medical News, July, 1894.
7. Savill, A.: Music, Health, and Character, London, 1923.

BANISTERIN OR HARMINE?

Messrs. Burroughs Wellcome and Co. call our attention to claims made at the Berlin Medical Society by Profs. Lewin and Schuster for a new drug called "banisterin," considered to be "a cure against paralysis caused by organic brain diseases." Prof. Lewin has described "banisterin" in two papers (*Archiv für experimentelle Pathologie und Pharmakologie*, 1928, cxxix., 133, and *Comptes rendus de l'Académie des Sciences*, 1928, clxxxvi., 469) and the composition and chemical characters of the alkaloid are so like those of harmine, discovered by Fritsch in 1847, as to leave little doubt in the minds of chemists that "banisterin" is harmine. Prof. Lewin remarks that this has been suggested to him, but he follows his brief description of the pharmacological action of "banisterin," in the second paper mentioned above, with the remark "To my knowledge harmine does not produce similar effects." In the *Archiv* paper he states he is relying on published information regarding the action of harmine.

Harmine is available in England, if not in Germany, and Messrs. Burroughs Wellcome and Co. regard it as essential that a pharmacological comparison of "banisterin" and harmine should be instituted as soon as possible. The point is important, because if Prof. Lewin's results are confirmed a demand may arise for this drug, and harmine can probably be made much more easily from the usual source, the seeds of *Peganum harmala*, than from the plant utilised by Prof. Lewin, *Banisteria caapi*. The latter is one of the suggested sources of the "yage" used by South American Indians as a narcotic. "Yage" has been repeatedly examined and the two most recent papers on the subject (Elger: *Helvetica Chimica Acta*, 1928, xi., 162, and O. Wolfes and K. Rumpf: *Archiv der Pharmazie*, 1928, cclxvi., 188) leave no doubt that the alkaloid it contains is harmine, though it was at first mistaken for a new alkaloid and called "yageine" by Villalba. Moreover Wolfes and Rumpf state that Prof. Lewin obtained his alkaloid from the same plant material as they did. The remarkable properties ascribed to "yage" are reflected in the name "telepathine," which Bayon gave to an alkaloid he obtained from "yage" and which is probably also harmine.

THE SCIENCE OF LIFE.

WE have received from the Amalgamated Press, Ltd. (Farringdon-street, London, E.C. 4), the first part of a serial entitled "The Science of Life," which is to be completed in about 30 fortnightly issues. The object of the publication is to present in a clear and readable form a complete and fully illustrated survey of biological knowledge. The joint authors are Mr. H. G. Wells, his son Mr. George Philip Wells, and Mr. Julian Huxley, who not long ago surrendered his chair of zoology at King's College, London, in order to set himself free for the work of popularising biological knowledge. Mr. Wells is now attempting to do for biology what he has done for history, and in a way "The Science of Life" may be regarded as supplementary to the "Outline of History" on the wider basis of the whole animal and vegetable kingdom. A week ago in the leading columns of *Nature* it was stated that the average citizen is not intensely interested in the biological nature of his own existence. Prof. Huxley's grandfather was convinced that the problems of life must one day be investigated by the methods of physical science if biological speculation is not to degenerate into a barren debate, and this survey should help in a really important way to interest the reading population of this country in biology. Should it be possible thus to educate parents we may then hope that the almost complete neglect of biology in the school curriculum will be made good, and that qualified men and women will be found to teach biology in the same way as formal physics and chemistry are now taught in the public and other secondary schools. The first instalment of the survey will be on sale to-day (March 7th) at 1*s.* 3*d.* of all booksellers.

‡ It is more than probable that harmony and orchestral scoring ("colour") played their part, but we have not been able to separate these factors.

DISTRICT NURSING AND INSURANCE COMPANIES.

AT the annual meeting on Feb. 28th of the Central Council for District Nursing in London, the report of the Council for the year 1928 was presented. During the past year the Council has been successful in extending and consolidating district nursing work in and near London, notably in Wandsworth, Bermondsey, Hammersmith, Sunbury, and Willesden, and the inauguration of a service for the new London County Council "Watling Estate" falling within the Hendon Urban District is projected.

During the year three nurses have benefited by the midwifery bursaries of £35 granted by the trustees of the London Parochial Charities. At the instance of the orthopædic registrar of Guy's Hospital, the executive committee has arranged with affiliated district nurses associations for the nursing of club foot in young children. Nurses will attend the massage department in order to be instructed in the particular manipulation necessary for the work. Special courses in the nursing of ophthalmia neonatorum have also been arranged by some associations. The need for organising the nursing of pemphigus has also been considered, and a list of instructions used by the Queen's and Ranyard nurses was circulated to other district nursing associations.

The committee have carefully considered the subject of district nursing in connexion with industrial insurance companies. The inclusion of nursing service for policy-holders of certain insurance companies has made the matter one of immediate concern to all district nursing bodies. One insurance company in some districts employs its own nurses, while in many others it contracts with the district nursing associations to attend its policy-holders on agreed terms. It is reported that the paid canvassers of the company compete with the voluntary canvassers of some of the district nursing associations, and that an extension of the provision of nursing by insurance companies is probable. The Council note that the provision of district nursing by profit-earning companies is said to be common in the United States, and one American company is extending its operations to this country.

They express regret at a development of district nursing which brings it into association with commercial bodies seeking to make a profit. In their view such association conflicts with the voluntary principle on which the work had hitherto been conducted; moreover, the association might possibly lead to a reduction in subscriptions. No objection can be taken to insurance companies providing nursing services for their policy-holders, but there is a difference of opinion as to whether or not it is desirable that this provision should be made by employing the nurses of the existing district nursing associations.

A further question has been raised as to the fee which district nursing associations should expect insurance companies to pay for each visit. Approved societies pay 1*s.* 4*d.* The cost of a district nurse's visit cannot readily be ascertained for the whole of London, but it is generally considered that 1*s.* 4*d.* is less than the average actual cost.

The total awards made to district nursing associations in 1928 amounted to £4443 4*s.* 3*d.*, which included £750 from the Appeal Fund.

THE TREATMENT OF TRACHOMA.

DURING the past 2000 years trachoma has gone under many names, including aspritudo, lips, bleary eye, miliary ophthalmia, and Egyptian ophthalmia. Though the claims of Noguchi to have discovered the causal bacillus have not been confirmed, the disease is admittedly due to infection by a specific micro-organism. The principal reason why it passes from the acute to the chronic stage is ignorance and neglect on the part of those afflicted. Hence it rarely remains in a simple form, and in fact it may be said not to exist without corneal pannus and ulceration.

Dr. Antonio d'Angelo [1] has recently published cases showing excellent results by a method of treatment with organic copper preparations which is somewhat novel in its application and detail. Small quantities of copper can, of course, be found normally in the human body, and when it is administered by mouth to animals and man in very small doses it does not produce any phenomena of intolerance but seems to have the virtues of a hæmogenic reconstituent. Nevertheless, its administration by mouth is not always advisable, while on the other hand intravenous injections are followed by symptoms of intoxication and even death. The objection to local application of inorganic copper salts to the eyes is the pain caused thereby.

Prof. d'Angelo uses in the treatment of trachoma intramuscular injections of cupriodase—a preparation invented by Serono—and a double oleate of copper and cholesterol. The latter can be instilled in a few drops under the tarsal conjunctiva and diffused by gentle massage with the eyelid closed, every ten days, while the cupriodase is given daily by intramuscular injection. From the details given of 24 cases of patients described as "discharged owing to blindness," "almost blind," and with "corneal pannus with only perception of light," and after treatment shown to the Ophthalmic Congress in Palermo as "completely cured," there should be something in this method of treatment deserving of consideration and further trial.

[1] Rass. di Clin. Terap. e Sci. Aff., Sept.–Oct., 1928.

OCULAR SENSATIONS AND "SEA-SICKNESS."

To the Editor of THE LANCET.

SIR,—The following case is probably an instance of ocular sensations being a factor in the production of "sea-sickness." A boy of some 15 years sat facing the engine in a crowded carriage from Newhaven to London. Soon after the start he became very sick and continued to be so every few seconds for quite a long time, until it occurred to me to suggest to his father, who was very anxious about him, that a change of seat might do some good. I gave mine, a back-to-engine seat, to the sufferer, whose sickness ceased instantly and gave place to an immediate sense of comfort and well-being. The suggestion was empirical, but a line of reasoning came in its train. The boy had not been sick on the boat from Dieppe, but his sense organs had been sensitised thereby so as to react in special circumstances, and the ocular reflex was set up when the eye was, so to speak, "running into" its impressions in the misty atmosphere which prevailed.

I am, Sir, yours faithfully,

University College, Cork, Feb. 28th, 1929. D. T. BARRY.

AIRCRAFT IN THE SERVICE OF HEALTH.

ON May 14th there will open in Paris the First International Congress on the use of aircraft in health services (aviation sanitaire). It will be presided over by Marshal Lyautey and Prof. Charles Richet, supported by Dr. Chassaing, General Lévy (Director of Health Services at the Ministry of War), and the president and vice-president of the Ligue Aéronautique de France. The scientific programme is an arduous one; it comprises the work of the aeronautical health service in warfare abroad, in the colonies and at sea, as a means of evacuation in wartime; the question of the immunity from attack of health service machines; the physiological conditions of air transport; the treatment of sick and wounded transported by air; the work of the service in peace-time and the material used. Visitors to the Congress will find much to interest them when their more serious work is over. An exhibition of aeroplanes will be held at the Villeneuve-Orby aerodrome where the machines will carry out extensive demonstrations, and the Congress will visit Rheims and be entertained by the Aero Club of the Champagne district. Particulars may be obtained from the Secrétariat-Général, 35, Rue François-Ier, Paris.

THE RECEDING CHIN.

THE strong silent hero with jutting-out chin had bes enjoy his popularity while he may. His knell was sounde a dozen years ago by Sir Arthur Keith and Prof. F. Woo Jones, who pointed out that the chin is a very recen acquisition, depending on the recession of the jaw resultin from the use of the hands and the kitchen to prepare foo for digestion. The alveolar margin has receded more quickl than the lower part of the mandible; hence the chin o which we are so proud. It is only a matter of time, the think, before the rest of the jaw will fade away too, and ou profile will run sadly from nose to neck. Mr. G. B. Palme has returned to this subject in a recent article [1] and confirm the work of previous investigators. Comparison of th outlines of the mandibles of eoanthropus, Heidelber Neanderthal, and modern man shows a steady reductio of alveolar length. If modern man and eoanthropus b superimposed with the third molar in alignment, the incisor of the modern will barely reach as far forward as the secon premolar of his ancestor. Already eoanthropus has lo many of the features of a typical jawful of teeth, adapted t fighting, seizing the prey, tearing it up and masticating i His canine has begun to come into line with the incisor- though it is still rather larger—and he has no "snout. With the perfection of cooking, man is reverting to th infantile type of mastication—pressing the food against th palate with the tongue and swallowing it. Soon—in th evolutionary sense, quite soon—man will dispense wi teeth altogether, his alveolus will degenerate entirely, as senility, and most probably his mandible will follow su So, at any rate, anthropologists think. It is for mode popular health movements to attack the culinary art the name of health and beauty.

[1] Brit. Dent. Jour., Feb. 15th, 1929.

Goulstonian Lectures

ON

POLYURIA

Delivered before the Royal College of Physicians of London

BY ERNEST BASIL VERNEY, M.B. CAMB., F.R.C.P. LOND.,

PROFESSOR OF PHARMACOLOGY IN THE UNIVERSITY OF LONDON, UNIVERSITY COLLEGE.

LECTURE I.—POLYURIA ASSOCIATED WITH PITUITARY DYSFUNCTION.

(Delivered on March 7th, 1929.)

MR. PRESIDENT AND FELLOWS,—In my first lecture I should like to deal with the nature and ætiology of the polyuria associated with disturbance in the function of the pituitary body; in my second, with the nature of the polyuria which follows experimental reduction of the renal tissue and with the mechanism of the production of this polyuria; and in my third lecture I propose to offer some remarks which I hope may be of service in the interpretation of pathological polyuria in man in terms of the findings and theories of experimental physiology.

POLYURIA FOLLOWING ISOLATION OF THE MAMMALIAN KIDNEY.

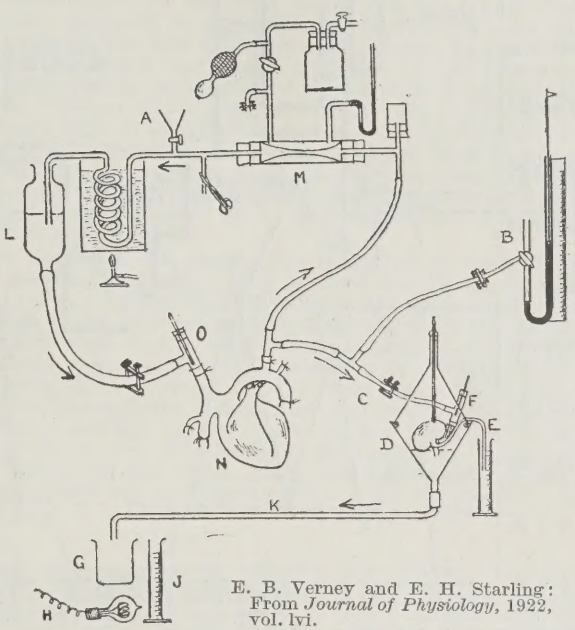
The heart-lung preparation of my inspiring teacher, the late Prof. Starling,[14] not only made possible the discovery by him of the nature of the response by cardiac muscle to changes in the work which it was called upon to perform, with the consequent formulation of this discovery into the law of the heart and its subsequent extension into a clear definition of cardiac tone, but also afforded a means whereby mammalian tissues might be perfused with oxygenated blood under rigidly controllable conditions, and their responses to measurable changes in their environment determined with accuracy.

The isolated kidney of the dog was first perfused by means of a heart-lung preparation by Bainbridge and Evans.[2] They were concerned primarily with the gaseous metabolism of the kidney, and obtained only a minimal amount of urine, and this only on the addition of sodium sulphate or Ringer's fluid to the circulating blood. In 1921 Prof. Starling and I started an investigation into secretion by the isolated kidney,[21] and since the basis of most of the experimental work to which I shall refer in these lectures has been the heart-lung-kidney preparation, a preliminary description of this preparation becomes essential in order that the results obtained by its use may be assessed in their true physiological tenour. All the operative work in the experiments described in these lectures was performed on dogs fully anæsthetised with chloralose, following chloroform and ether induction. The preparation is shown diagrammatically in Fig. 1 and its description is given briefly in the legend.

The advantages of such a preparation in the study of the mechanism of the secretion of urine are evident. The pressure at which the blood is supplied to the kidney, the temperature of this blood, and its content of gaseous and other solutes are directly under our control. The flow of blood and of urine can be accurately measured at any time, and samples of these fluids readily collected in quantities permitting an accurate chemical analysis. It may be said at once that the urine secreted by a kidney so perfused differs in very marked degree, both in quantity and chemical composition, from that secreted by a dog's kidney denervated, but remaining in situ. These differences will be referred to in a moment, but before describing them it is expedient to consider to what extent, if any, these observed changes are due to the development in the blood of some change of state or composition of no physiological, as distinct from toxicological, significance.

Freshly defibrinated blood has been used as the perfusate, but that the specific characters of the urine secreted by the isolated kidney are due to the employment of such blood has been readily disproved by defibrinating the intact animal.[17] If such be done, the urine secreted by the kidneys in situ retains its normal characteristics. Further, in a few experiments with the heart-lung-kidney preparation the anticoagulant heparin has been employed, instead of resort being made to defibrination; the abnormal characters of the urine are still in evidence. These facts suggest that the abnormality observed in the secretion of the kidney, when isolated and perfused with the heart-lung preparation, is to be attributed to some deficiency in its mechanism rather than to the intrusion of some new and foreign activity—a suggestion to which, as we shall see later, experiment lends a concrete significance.

FIG. 1.



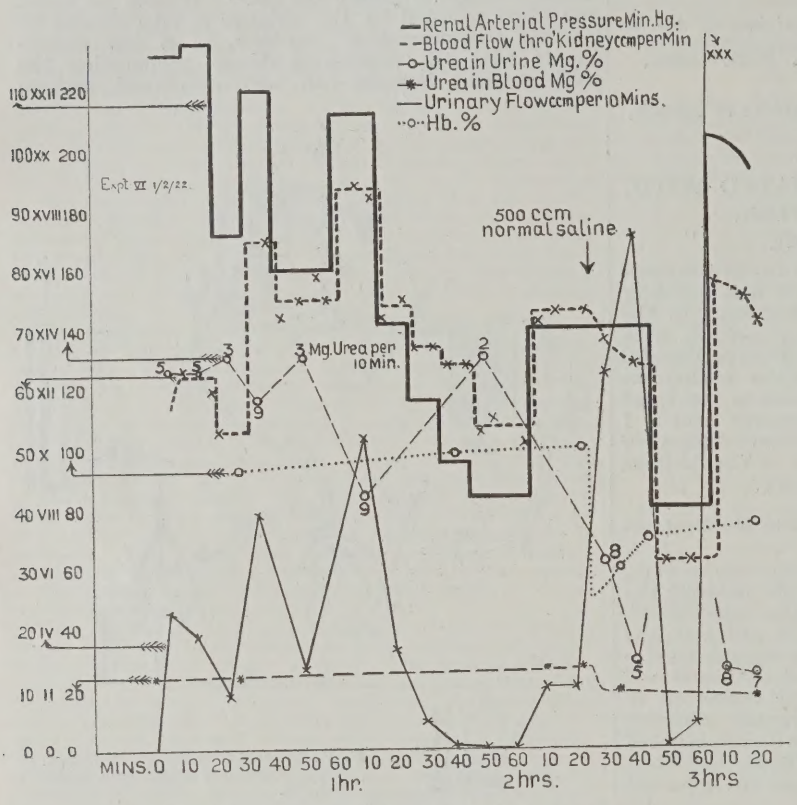
E. B. Verney and E. H. Starling: From *Journal of Physiology*, 1922, vol. lvi.

Diagram of heart-lung-kidney preparation. The blood in the venous reservoir L passes through a cannula O, tied into the superior vena cava, to the right auricle. After passing through the lungs, the blood is pumped by the left ventricle through a cannula tied into the brachiocephalic artery to a variable resistance M, whence it returns through a warming coil to the venous reservoir. The tube C conducts arterial blood to a cannula F tied into the renal artery of the kidney D. The venous blood from the kidney is conducted to a vessel G, and returned at intervals to the venous reservoir L. The pressure of the blood-supply to the kidney is recorded by a mercury manometer B. The cannula E is placed in the ureter and the urine collected in a graduated vessel as shown. The cannulæ O and F are provided with thermometers.

The urine secreted by the isolated kidney is clear, yellowish in tint, and gradually pales as the experiment proceeds. Protein is absent, or present in the merest trace, and then only in the first few samples collected. It contains chloride in a much lower concentration than the serum, urea, and sulphate (when this last is added to the blood) in a higher concentration, and is free from glucose. The molybdate test for phosphate is negative, and ammonia is present only in the first few cubic centimetres of the secreted fluid. The total molecular concentration as determined by the depression of the freezing-point is far below that of the serum. The rate of urine flow is abnormally rapid, 1 to 2 c.cm. per minute, for example, being a rate which is quite commonly encountered. The urine, then, is a copious and dilute one, and I should

like to give especial emphasis to its low content in chloride, and to the fact that the typical characteristics of the urine do not suddenly appear at the very beginning of an experiment; they gradually intrude into the picture, and gain in definition as the experiment proceeds.

FIG. 2.


—Renal Arterial Pressure Min. Hg.
--Blood Flow thro' Kidney ccm per Min
-o-Urea in Urine Mg.%
-*-Urea in Blood Mg %
—Urinary Flow ccm per 10 Mins.
··o··Hb.%
Expt VI 1/2/22.
500 ccm normal saline
3 Mg. Urea per 10 Min.
MINS. 0 10 20 30 40 50 60 10 20 30 40 50 60 10 20 30 40 50 60 10 20
1 hr.
2 hrs.
3 hrs

Verney and Starling: Ref. as Fig. 1.
This experiment demonstrates the urine flow responses of the isolated kidney to changes in perfusion pressure.

To what causes are these curious changes to be attributed? For curious they are when we remember that any increase in the rate of urine elimination by the kidney in situ in the experimental animal is typically accompanied by an approach in the composition of the urine towards that of the plasma. If the urine contain a higher percentage of chloride than the plasma, then an increase in the output of water, produced, for example, by section of the sympathetic supply to the kidney, will be accompanied by a fall in the percentage content of the urine in chloride. If, on the other hand, the urine contain a lower percentage of chloride than the plasma, then the diuresis following sympathetic section will exhibit a percentile rise in the urinary chloride, in each case the diuretic response being attended by an approximation of the chemical composition of the urine towards that of the plasma. But that the normal responses of the kidney to such changes in environment as are produced, for example, by variations in arterial blood pressure, are still exhibited when the organ is perfused in the isolated state, is readily shown by the results of such an experiment as that represented in Fig. 2. It will be seen that the rate of urine flow varies with, and in the same sense as, the height of the arterial blood pressure, and that the concentration of urea in the urine shows an inverse relationship to the rate of urinary flow. And in the case of chloride which, as we have seen, is present in the urine in such low concentration, a percentile rise accompanies the increase in urinary flow produced by an increase in the perfusion pressure. Pressure diuresis, then, as produced in the isolated kidney, gives rise to such changes in the composition of the urine as our knowledge of the reactions of the kidney in situ would lead us to expect—viz., a movement towards the composition of the protein-free plasma. And whether such a change is accompanied by a percentile rise, as in the case of chloride, or by a percentile fall, as in the case of urea, the minute output of each substance secreted is increased during a diuresis provoked by a rise in perfusion pressure.

The ingravescent polyuria of the heart-lung-kidney preparation, being accompanied at constant perfusion pressure by a recession of the chloride concentration of the urine from that of the plasma, and by a fall in the amount of chloride eliminated per unit interval of time, cannot therefore be explained on any hypothesis embodying the conception of a progressive increase in the susceptibility of the kidney to the pressure stimulus. Neither are the observed changes due to acapnia. In the early experiments performed by Prof. Starling and myself,[21] the lungs were ventilated with air and the CO_2 content of the blood fell to a very low level. The fact that prolonged hyperpnœa in man may give rise to a marked polyuria (Collip and Backus[5]), accompanied by a fall in the percentage of urinary chloride (Davies, Haldane, and Peskett[8]), suggested that acapnia might be the cause of the secretory abnormalities observed in the case of the isolated kidney. This suggestion was shown to have no basis in fact, since ventilation of the lungs with air containing CO_2 in as high a concentration as 11 per cent. had no inhibitory effect on the development of the polyuria and the concomitant fall in urinary chloride.[17] Many attempts were made to break down this chloride retention by raising the chloride concentration in the serum to a level higher than the abnormally high one which the retention itself was causing, but all were unsuccessful in attaining this object.

We now suspected that an explanation might be found in the disappearance from the blood of some body which was normally concerned in regulating the output of water and chloride by the kidney. Von den Velden [22] was responsible for the discovery that the polyuria of diabetes insipidus in man could be controlled by subcutaneous injections of extract of the posterior lobe of the pituitary body, and since the urine obtained from the isolated kidney of the dog resembled in its composition that typical of this condition, it was decided to explore the possibility of the two conditions having a common ætiological basis. Pituitary extract was therefore introduced into the circulating blood of a heart-lung-kidney preparation. The polyuria was inhibited in a dramatic fashion, and analysis of the urine showed that the chloride precentage had risen to so high a figure that the minute output of chloride was markedly increased. The data of an experiment which illustrates these facts are collected in the following table. Such changes in water and percentile chloride output invariably occurred, whilst every other means adopted to decrease the urine flow, such as lowering of the blood pressure or the addition of adrenalin, failed to bring about that rise in the urinary chloride which is now believed to be a specific effect of pituitary extract.

We must now inquire whether this action of pituitary extract on the isolated kidney is of any physiological significance in relation to the activity of the normal kidney. Does the pituitary body, through the intermediation of an internal secretion, continually hold in check those primitive instincts in the kidney which, when given rein to, result in its reversion to the type of gland characteristic of the fish and amphibian classes of the vertebrate phylum? In such animals the power to secrete a urine having a greater total molecular concentration, and, in the case of chloride, a greater partial molecular concentration than that of the plasma, is absent; and it may well be that our egress from the sea was accompanied by a demand for an increased degree of control over the salt-and-water metabolism of our bodies, a demand which was responded to by a functional reassociation of those parts which in the higher invertebrates were both engaged in excretory work. For on Gaskell's view of vertebrate development the pituitary body is the homologue of the coxal glands of the crustacea.

Time.	T. °C.	B.P. mm. Hg.	Blood flow c.cm. min.	Hb per cent.	Serum.		Urine.				
					Urea per cent.	NaCl per cent.	c.cm. /15 mins.	Urea per cent.	NaCl per cent.	NaCl/ 15 mins.	
1·35	34	116	250	100	29	—	4·4	545	0·62	—	
2·04	35	116	353	—	—	—	2·9	566	0·33	10	
2·34	35	116	353	—	—	—	3·6	502	0·13	5	
2·55	35	116	333	—	—	—	5·5	284	0·05	3	
3·10	35	115	333	—	—	—	13·1	148	0·01	1	
3·15	35	114	300	—	—	—	—	119	0·14	11	(*a*)
3·22	35	115	300	—	—	—	7·7	—	0·32	17	
3·40	35	114	316	—	—	—	5·2	183	0·29	15	
3·55	35	116	343	122	17	—	5·2	—	—	—	(*b*)
4·11	36	116	353	93	14	—	27·9	72	0·16	44	
4·16	35	115	324	104	13	—	27·3	49	0·22	60	

(*a*) Pituitrin 0·5 c.cm.
(*b*) Add 200 c.cm. Ringer +1 c.cm. 1 : 100,000 adrenalin HCl.

Starling and Verney: From Proc. Roy. Soc. B., 1925, vol. xcvii.

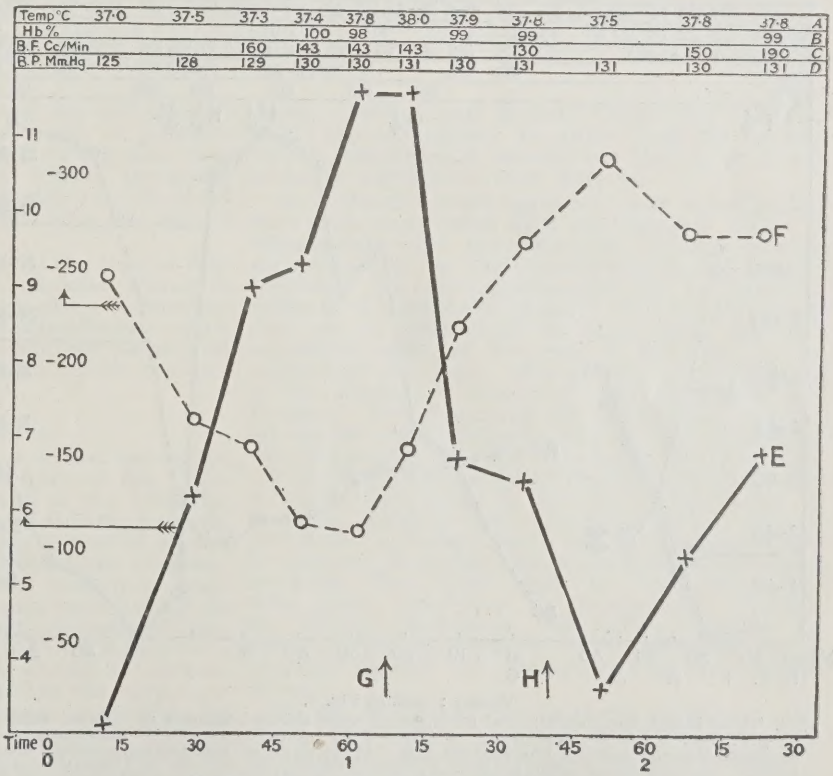
This experiment demonstrates the effect of pituitrin on the polyuria of the isolated kidney and on the composition of the urine which it secretes. The pituitrin used was a 0·05 per cent. extract of the dried posterior lobe of ox gland.

Some experiments were therefore undertaken of such a nature as possibly to give an answer to this question.[19] If it be a fact that the polyuria which gradually appears when the isolated kidney is perfused is due to the gradual disappearance of the internal secretion of the pituitary body from the blood, it might be expected that the passage of some of the blood of the heart-lung-kidney preparation through the head of a dog would result in the blood becoming recharged with pituitrin, and so lead to an inhibition of the rate of urine secretion by the isolated organ. This expectation was fulfilled as the result of some experiments to which reference will now be briefly made.

A heart-lung-kidney is prepared and the effect on the quantity and composition of the urine of switching various parts of the tissue of another dog into perfusion-parallel with the kidney is observed. By the term perfusion-parallel is to be understood the diversion of some of the blood from the arterial side of the heart-lung to the particular tissue perfused, the efferent blood from this tissue being led back to the venous side of the heart-lung, and so reaching eventually the isolated kidney, also connected with the arterial side of the heart-lung preparation. The isolated kidney is, therefore, used as a test object by means of which the blood passing through it may be biologically assayed as to its content in pituitrin-like substances. Four series of experiments were performed. In the first series the head and neck were perfused in parallel with the kidney; in the second series the hind legs and pelvis; in the third the head and neck after exposure of the pituitary body, and in the fourth the head and neck subsequent to removal of the pituitary body. The main artery and vein, to and from the part to be perfused, were carefully isolated and included within loose ligatures in such a manner that the appropriate cannulæ could be inserted at the desired moment, and the perfusion started with the minimum period of circulatory arrest.

In Fig. 3 are charted the results of an experiment of the first series. The gradual rise in the output of water by the isolated kidney and the concomitant fall in the percentage of chloride in the urine in the early part of the experiment are clearly seen. The temperature of the blood supplied to the kidney, the hæmoglobin content of this blood, the rate of blood flow through the kidney, and the pressure of supply, are recorded at the head of the figure. At the point G, by which time the polyuria was well developed, the head, neck, and right forelimb were switched into perfusion-parallel with the kidney. It

FIG. 3.



Verney: From Proc. Roy. Soc. B., 1926, vol. xcix.

A, Temp. of blood at renal cannula. B, Hb per cent. of blood, relative to the initial sample. C, Renal blood flow in c.cm. per min. D, B.P. in renal artery in mm. Hg. At "G" head, neck, and right forelimb were switched into perfusion parallel with the kidney, and at "H" were switched out of the circuit. E, Urine flow in c.cm. per 15 min. F, Urinary chloride (as NaCl) in mg. per cent.

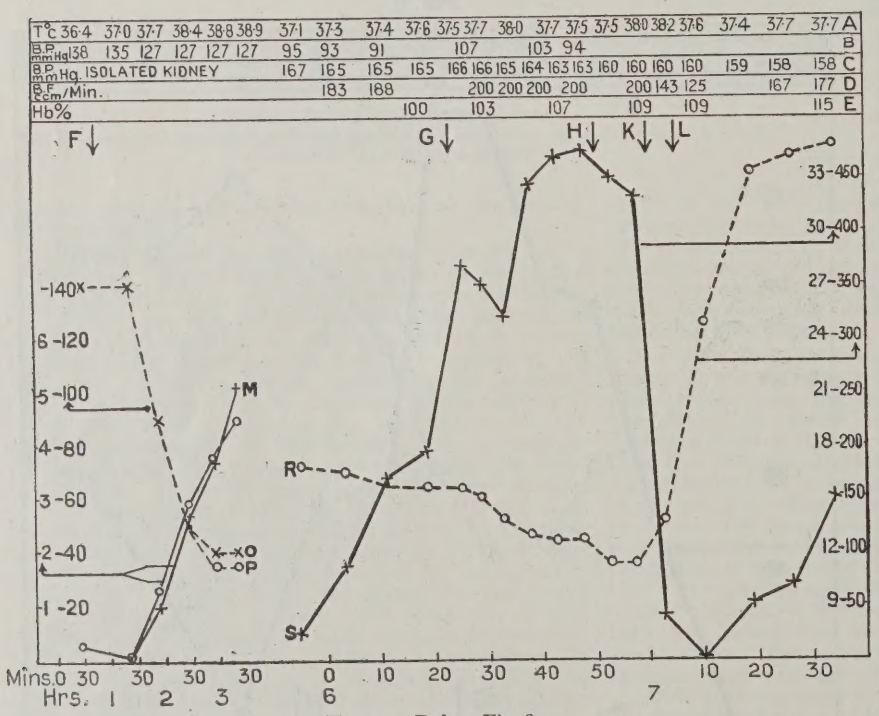
will be seen that this procedure evoked a marked and ingravescent fall in the urinary flow, accompanied by an equally well-marked and ingravescent rise in the percentage of chloride in the urine. Indeed, in this experiment there was actually a rise in the absolute amount of chloride during the period G to H, as compared with that excreted immediately before switching the head into the circuit. At H the head and neck were switched out of the circuit, and it is seen that after a short period of time the polyuria returned, and the urinary chloride began to fall again. Further, it is to be noted that a small diminution in renal blood flow resulted from the passage of the blood through the head of the animal, followed by a recovery during the second polyuria. The blood pressure at the renal cannula was constant throughout the main part of the experiment. Such an experiment, which is illustrative of the results obtained in this series of investigations, proves conclusively that the blood of the heart-lung-kidney preparation, when perfused through the head and neck of another animal, picks up some substance which reacts on the kidney in a manner qualitatively indistinguishable from that of pituitrin.

The second series of experiments was designed to control those which have just been described. It may be said at once that perfusion of the pelvis and hind limbs of a dog in parallel with the isolated kidney has no detectable influence on the polyuria and low chloride output of this organ. On the other hand, the results already described as accruing from the perfusion of the head and neck in parallel with the kidney appear in their entirety when the pituitary body is exposed by temporal decompression. If, however, the pituitary body is first removed and the experiment then proceeded with, the isolated kidney is completely unaffected, as far as my observations go, by the passage of the blood of the heart-lung-kidney preparation through the head. In such an experiment we see a profuse polyuria appearing in the animal from which the pituitary body has been removed. It is clear that the appearance of the polyuria in the animal which is intact except in so far as the pituitary body is concerned, is closely related with the persistence of the polyuria of the isolated kidney during the time that the head of the animal is being perfused. The results of an experiment which illustrates these facts are given in Fig. 4. In this experiment the pituitary body was exposed through the temporal route and the urine collected from each ureter until sufficient for purposes of analysis had accumulated. At the point F in the figure the temporal lobe was gently elevated, the pituitary body freed from its connexion to the base of the pituitary fossa and removed with long forceps. Occasionally in such experiments the body—anterior and posterior lobes—came away cleanly in one piece and the removal was, as far as could be determined with the naked eye, complete. More frequently, however, the body was removed in fragments. Hæmorrhage was very slight, a fact which is doubtless to be correlated with the rapid and profuse branching into vessels of almost capillary calibre of the sheaf of vessels streaming down from the circle of Willis around the stalk of the hypophysis (Dandy and Goetsch).[7] The operations both of exposure and removal were performed under direct illumination from a frontal lamp, so that stereoscopic vision was not interfered with.

It will be seen from the figure that removal of the pituitary body was followed, after a latent period of about 50 minutes, by an ingravescently profuse polyuria and by a concomitant fall in the percentage of chloride in the urine. These acute effects of pituitary removal will be considered later. At present it suffices to note the occurrence, and to state that the resultant polyuria and low chloride percentage respond to intravenous injections of pituitrin in a manner exactly analogous to that of the polyuria and low urinary chloride encountered with the isolated kidney.

After the polyuria had become well established, the chest was opened, and the animal prepared for heart-perfusion. A heart-lung-kidney preparation was then made. The urine flow and urinary chloride of the isolated kidney are charted to the right of the figure. At G the head and neck of the polyuric animal were switched in parallel with the isolated kidney. There was a small and quite transient fall in the urine flow, which then rapidly mounted again to reach the large value of over 2 c.cm. per minute. The urinary chloride showed no appreciable brake in its rate of fall nor was there any diminution in the blood flow through the kidney resulting from the passage of the blood through the head of the animal. At H the head and neck were switched out of the circuit. That the absence of any demonstrable effect

FIG. 4.



Verney: Ref. as Fig. 3.

A, T. °C. of intact dog (rectal), and of blood in renal arterial cannula of isolated kidney. B, B.P. mm. Hg in femoral artery of intact dog. C, B.P. mm. Hg in renal artery of isolated kidney. D, Blood flow in c.cm./min. E, Hb per cent. relative to the initial blood sample. M, Urine flow of right kidney. N, That of left in c.cm./15 min. O, Urinary chloride (as NaCl) in mg. per cent. right kidney, and P, that of left. R, Urinary chloride (as NaCl) in mg. per cent., isolated kidney. S, Urine flow isolated kidney in c.cm./15 min. At F the pituitary body was removed from the intact dog. At G the head, neck, and right fore-limb were switched into perfusion parallel with the isolated kidney, and at H were switched out of the circuit. At K 0·02 c.cm. "Infundin" was added to the blood perfusing the isolated kidney, and at L a further 0·01 c.cm. was added.

on the isolated kidney, of the passage of the blood of the preparation through the head of the dog was due to the lack of the pituitary hormone and not to any insusceptibility of the isolated kidney to the pituitary stimulus, was shown by the addition of pituitrin to the blood at the points K and L. The typical response to pituitrin is immediately made manifest.

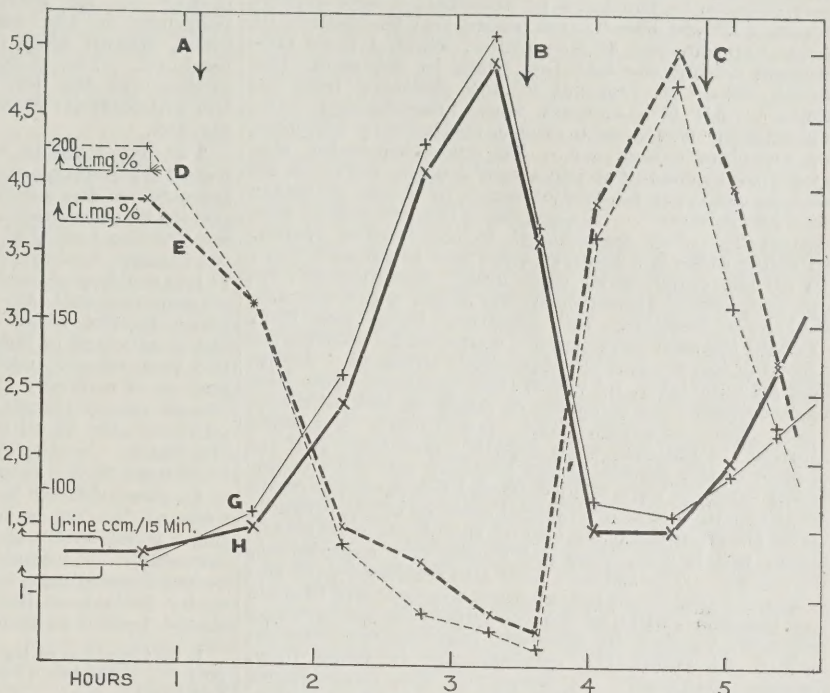
There seems to be only one interpretation to be placed on the experimental results which have just been recorded: pituitrin is contributed by the pituitary body to the blood during its passage through the head and neck. Attention may be directed especially to the ingravescent manner in which the reaction of the isolated kidney reveals itself during the period of head perfusion, a phenomenon which is readily interpreted by, and indeed is to be expected from, the increasing number of circuits which the blood makes through the tissues of the head. During this time, then, we must assume that the balance of secretion over destruction is turned in favour of the former. It will have been observed that in those experiments in which the pituitary was removed before switching the head into the circuit there was a small inhibition in the rate of urine flow and a small augmentation in the chloride output (see Fig. 4). This was a transitory phenomenon, however, and the reappearance and augmentation of the polyuria and chloride fall in the time during which the blood was still shunted through the head showed that, even if pituitrin were being continuously secreted during this time by the remaining fragments which inevitably escaped removal, its rate of destruction in the blood and tissues was certainly greater than its rate of formation.

There can be no doubt, then, that the copious flow of dilute urine produced by the isolated kidney is due to the fact that the pituitary gland is excluded from the circulation. And the experiments which have just been described have in addition an obvious bearing on the much debated question of the ætiology of diabetes insipidus.

Diabetes Insipidus.

In 1912 Frank [10] drew attention to the association between lesions in the neighbourhood of the hypophysis and diabetes insipidus, and in the following year von den Velden [22] demonstrated that the polyuria of this disease could be completely controlled by the subcutaneous injections of an extract of the pituitary body. Since that time two main views have been held on the ætiology of this disease, each having its adherents both on the clinical and experimental side. According to the one view the polyuria is due to a disturbance of the hypothalamus, leading to a failure of this part of the brain to regulate the output of water and chloride by the kidneys. According to the other view the polyuria is due to interference, either as the result of disease or as the result of experimental intervention, with the functions of the pituitary body. The occurrence of polyuria following the experimental removal of the pituitary body in mammals was reported by several investigators before the work of Frank [10] and of von den Velden [22] was published. Vassale and Sacchi [18] in 1892 noted this sign in some of their experiments and recorded the low specific gravity of the urine. Gemelli [11] also observed it frequently during the first five to six days following "total" ablation of the hypophysis.

Fig. 5.



The control of experimental diabetes insipidus in the dog by intravenous infusion of pituitrin. At A pituitary body removed. At B infusion of "Infundin" (2 per cent.) commenced, and finished at C. H, Urine flow right kidney in c.cm. per 15 min., and G, that of left kidney. E, Chloride of urine from right kidney, and D, that from left in mg. per cent. as NaCl.

Crowe, Cushing, and Homans [6] state that following total hypophysectomy in adult dogs the urinary output diminishes to anuria, but that in puppies a transient polyuria is often observed.

Since Frank's paper appeared many investigations have been undertaken with the expressed object of determining more accurately the relation between disturbance in the hypothalamic region and diabetes insipidus. On the experimental side we have the evidence of Camus and Roussy [3] that the polyuria is due, not to ablation of the hypophysis, but to a superficial lesion of the base of the brain in the optopeduncular space. This experience is acquiesced in by Houssay,[13] Leschke,[15] and by Bailey and Bremer.[1] Indeed, Camus and Roussy, and Leschke are agreed that extirpation of the whole hypothesis does not produce polyuria if the brain base is avoided. On the clinical side Leschke [15] has collected many cases in which destruction of the whole hypophysis by tumours, syphilitic and tuberculous disease, and by cisticercus cellulosæ have not been accompanied by diabetes insipidus, whilst pathological processes involving the brain base in the optopeduncular region have been so accompanied. Further, the clinical observation that thirst precedes the onset of the polyuria is often advanced as an argument against the hypophyseal ætiology of the disease.

On the other hand, we have the presence in this region of a body from which an extract can easily be prepared which inhibits in the vast majority of cases the diuresis of diabetes insipidus, whether clinical or experimental. Camus and Roussy,[4] however, state that the immediate polyuria following a lesion in the optopeduncular space in dogs is not controlled by pituitary extract, and that in experimental

polyuria of permanent duration the results of opotherapy are inconstant, without lasting effect, and, when positive, not specifically due to pituitary extract.

Before attempting to correlate the evidence which is at present available in connexion with the ætiology of diabetes insipidus, into a theory which does not run counter to the facts of observation and experiment, I should like to put before you the results of some experiments, 33 in number, which I have performed during the last few years to determine the acute effects of removal of the pituitary body in dogs.[20] All the animals were anæsthetised with chloralose. Some were give a preliminary injection of morphia, others not. To some tap-water was given by stomach-tube in doses ranging between 25 and 40 c.cm. per kg. body-weight, to others no water was administered. In some cases the left kidney was denervated after exposing it in the lumbar region, in other cases the kidneys were not interfered with. In all the experiments each ureter was exposed, by extraperitoneal dissection in the flank, and a cannula tied into position. The pituitary body was then exposed through the temporal route, and a continuous record of the arterial blood pressure obtained. About half an hour later, by which time sufficient urine had been collected for purposes of analysis, the pituitary body was removed. The preliminary exposure allowed its removal with rapidity and ease, and no change in the arterial blood pressure was detectable. Urine samples were then collected till the experiment was brought to a close. Serial sections of the infundibular region of the brain and of the pieces of pituitary tissue which were removed during the experiment, were made. The kidneys were also sectioned with the primary intention of determining whether any fibrosis was present. In 18 of the experiments a well-marked polyuria, varying in different experiments between 4 and 24 times the original rate of urine flow, became manifest. In seven of the experiments there was only a slight increase in urine flow following removal of the pituitary body, and in the remaining eight experiments no increase was detectable.

The results of an experiment in which polyuria appeared to a marked degree are plotted in Fig. 5. It will be seen from this experiment that removal of the pituitary body was followed after a latent period of 30 minutes by an increase in the water output of both kidneys and by a fall in the percentage of chloride in the urine. When the polyuria had reached its maximum figure a slow intravenous infusion of pituitary extract was begun with the object of determining whether this polyuria could be inhibited by this means. It will be seen from the figure that the kidney responds immediately to this infusion by a diminution in the water output and a percentile rise in the excretion of chloride. By carefully regulating the rate of infusion it was possible to maintain the rate of urine flow at approximately its original level. When this was done it was found that the chloride content of the urine had also returned approximately to its original value. The continuous infusion of pituitrin therefore had brought the kidney back to a physiological state indistinguishable from that which it exhibited before its experimental divorce from the pituitary body. This infusion was stopped at C, and after a short latent period, 15 minutes, the increase in urine flow and fall in urinary chloride again projected into the picture. In eight experiments of this type the mean of the rates of infusion which were found necessary to inhibit the polyuria completely was a fiftieth of an international unit per kilo per hour, the extremes being one-hundredth and one-thirtieth of a unit. No experiments have so far been performed to determine whether the oxytocic or pressor factor is responsible for the control of a polyuria brought about in the manner described. It is of interest to know that no change in the concentration of hæmoglobin in the blood accompanies the polyuria. The water therefore passes from the tissues to be excreted by the kidney without producing any obvious signs of its transit.

In those experiments in which polyuria appeared, there was a latent period varying from 25 to 60 minutes between the time of removal of the pituitary body and the time at which the first signs of an increase in urine flow appeared, a delay which is clearly to be attributed to the gradual disappearance of the antidiuretic hormone from the blood stream after its seat of production had been removed. The polyuria was found to be more profuse on the left side in those cases in which the sympathetic nerves to the left kidney had been divided.

The experiments which have just been described would lend strong support to the view that diabetes insipidus is due solely and directly to the lack of the pituitary antidiuretic hormone in the blood were it not for the fact that in 25 per cent. of the cases, as previously stated, the polyuria did not appear. It has not been found possible to correlate this failure of response with the presence or absence of any of those factors which varied or were varied, during the conduction of this series of experiments—namely, the preliminary injection of morphia, the administration of water by the mouth, the sex of the animal, the amount of pituitary tissue which escaped removal, or the degree of injury to the infundibular region of the brain. Neither was the absence of response due to fibrosis of the kidney.

In view of these facts, and of the evidence brought forward by other investigators against the hypophyseal ætiology of diabetes insipidus, it becomes necessary to examine this evidence more closely before discarding a theory to the validity of which so many facts bear testimony. This evidence may be stated briefly as follows:—

1. Extirpation of the whole hypophysis does not produce polyuria if the brain base is avoided. (Camus and Roussy; Leschke.)

2. Polyuria is produced by a superficial lesion of the base of the brain in the optopeduncular space. (Camus and Roussy; Leschke; Houssay; Bailey and Bremer.)

3. Pathological destruction of the whole hypophysis in man is not necessarily followed by diabetes insipidus. (Leschke.)

4. Pathological processes involving the base of the brain in the optopeduncular space are often accompanied by diabetes insipidus. (Leschke.)

5. Thirst often precedes the polyuria.

6. Surgical removal of the pituitary body is not invariably followed by diabetes insipidus. (Verney.)

A study of serial sections of the infundibular region after removal of the pituitary body demonstrates quite clearly the intimacy of the association between the pars tuberalis and the base of the brain. The association is so close that complete experimental removal is impossible without extensive injury to the nerve structures in the floor of the third ventricle. And a considerable body of evidence exists that such complete removal is incompatible with the survival of the animal. Further, destruction of the pituitary body by disease must be shown by serial sections to be complete, before absence of polyuria in such conditions can be brought forward as unequivocal evidence against the part played by the hypophysis in producing diabetes insipidus. And this has not been done. On the other hand, the non-appearance of the polyuria when the pituitary body is only partially removed is clearly not evidence against the polyuria, when it appears, being due to deficiency in the secretion of pituitrin. Further, it may be pointed out that a polyuria resulting from injury to, or disease in, the hypothalamic region does not preclude the possibility of the hypophysis being concerned in its production. Nor can the impotence of pituitrin to inhibit the polyuria in certain cases be accepted as evidence against the hypophyseal ætiology of the condition, unless the activity of the preparation is concurrently controlled by the production of positive

results in other cases. Again, the fact that the sensation of thirst sometimes precedes the onset of polyuria is clearly not irreconcilable with the view that the polyuria itself is due immediately to an inhibition of the activity of the pituitary body in so far as the secretion of the antidiuretic principle is concerned.

We may conclude that no evidence of an incontrovertible nature exists at the present time against the view that the polyuria of diabetes insipidus is due immediately to an inhibition or arrest of the secretion of an antidiuretic principle by the pituitary body, and that there exists a strong body of evidence in its favour.

We may now consider for a moment those experiments of the series to which reference has already been made, in which subtotal removal of the pituitary body was not followed by a copious flow of urine. It may be that the remaining fragments of pituitary tissue were still secreting a quantity of the antidiuretic hormone sufficiently great to prevent the appearance of the polyuria. On the other hand, it may be that in these cases the kidney itself failed to respond to the withdrawal of the hold which the pituitary hormone was previously exerting. We must remember that the incidence of the polyuria in all probability demands an increase in the work done by the kidney, and it has been shown in the case of the isolated kidney of the dog, that the inhibition of the polyuria of this preparation by pituitrin is accompanied by a fall in the oxygen consumption of the kidney (Fee and Hemingway [9]). It may well be that the kidney must be in a reactive state—in a condition of good "tone"—before it can respond to the removal of the inhibitory influence of pituitrin. The reins may be slackened, but the horse does not of necessity increase its pace. This conception of the condition of the kidney itself contributing to the degree of its diuretic response, gains in plausibility when it is pointed out that in my own series of cases it was observed that this response to the removal of the pituitary body was much more likely to occur in the case of young and lively dogs than of those older in years or more phlegmatic in temperament. And in man diabetes insipidus is a disease affecting young people. Further, as we shall see in the next lecture, a diminution in the reserves of the isolated kidney leads to a diminution in the antidiuretic response to a given concentration of pituitrin in the blood. It is evident, then, that the condition of the kidney itself is to be regarded as an important factor in determining whether, and if so to what degree, it will respond to a diminution in the secretion of the pituitary body.

The symptom of thirst, which may be the initial complaint in diabetes insipidus in man, leads us to a consideration of the mechanism involved in the response by the kidney to the intake of large volumes of water by the mouth.

Polyuria Following Water Ingestion.

If a large volume of water be drunk by a healthy man a great increase in urine flow soon becomes evident, and the volume of water ingested is rapidly and quantitatively excreted. 2000 c.cm. of warm tap-water swallowed in 12 minutes by one man were completely eliminated within four hours, the maximum rate of flow, 12 c.cm. per minute, being reached about 50 minutes after the beginning of the ingestion. An increase from the resting level of excretion was detectable within 20 minutes. In the case of another healthy man the ingestion of 2500 c.cm. of warm tap-water in 15 minutes was followed by an increase in urine flow, detectable within 30 minutes of the beginning of the experiment, and mounting rapidly to reach the high rate of 22 c.cm. per minute 70 minutes after the beginning of the experiment. In this case the volume of water drunk was quantitatively eliminated within three hours. There is thus considerable variation among normal men in the type of curve obtained by plotting rate of water elimination against time. In some the curve is flattened and somewhat protracted, in others higher and less prolonged.

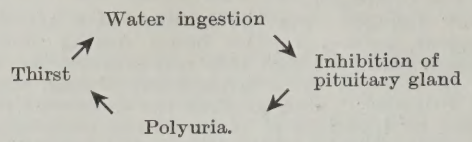
Any changes from the normal, of a physical or chemical nature, in the blood during this large diuresis, and to which this response by the kidney can be referred are conspicuously absent. Haldane and Priestley [12] showed that the enormous diuresis caused by ingestion of water was not dependent on the general dilution of the blood, although Priestley [16] was able to detect a small diminution in the electrical conductivity of the serum under these conditions. Further, no change is detectable in the osmotic pressure of the plasma proteins at the height of the diuresis from its value immediately before the ingestion of the water.[20] If, on the other hand, water or hypotonic saline be slowly injected intravenously into the dog a diminution rather than an increase in the rate of urine flow occurs.

What, then, in the absence of any blood changes which might be regarded as sufficient in themselves to evoke so gross a diuresis, is the stimulus to the kidney causing it to react in so perfect a manner by secreting a copious urine of extremely low specific gravity? The whole experimental investigation of the question is surmounted by the difficulty that water diuresis cannot be produced in animals when under the influence of an anæsthetic. When water (30 to 40 c.cm. per kg. body-weight) is introduced into the stomach of a dog under chloralose anæsthesia this water is rapidly absorbed from the gut, and its passage into the tissues is proved by the fact that no variation in the concentration of hæmoglobin in the blood occurs during this absorption.[20] But the water fails to pass from the tissues to be excreted by the kidney.

We have already seen that subtotal removal of the pituitary body in dogs is followed in favourable circumstances and after a latent period of 30 to 60 minutes by a profuse flow of urine of low specific gravity, and that the water is transported from tissues to kidney without there being detected any changes in the state or composition of the blood. Is it possible that when water is ingested by man or is introduced into the stomach of an unanæsthetised dog the increased load of water in the tissues, following its absorption, produces, through the intermediation either of a chemical messenger or of the nerve channels subserving the sensation of thirst, a temporary inhibition of the secretion by the pituitary body of the antidiuretic hormone, and the consequential excretion by the kidney of a copious and dilute urine? The only direct piece of evidence in favour of this hypothesis is the fact that, as Priestley[16] showed, water diuresis in man can be completely inhibited and delayed for a period of four to six hours by the intramuscular injection of small amounts of an extract of the pituitary gland. But when to this piece of direct evidence we add evidence of a more indirect character obtained from a comparison of the course, nature and responses of the diuresis following water ingestion with those of the polyuria of the isolated kidney and of experimental diabetes insipidus, conviction as to the truth of this hypothesis gradually gains ground. In all three conditions the character of the urine is the same, and in all there is a latent period of approximately the same duration between the laying down of the primary stimulus, be it isolation of the kidney, removal of the pituitary body, or the ingestion of water, and the diuretic response by the kidney. All react in precisely the same manner to the administration of an extract of the pituitary body, and both in diabetes insipidus and in water diuresis the doses of extract required to produce inhibition of urine flow are of the same order of magnitude. Again, in none of the three conditions has any change in the composition of the blood, to which the diuresis might be ascribed, been detected.

Perhaps the thesis of this lecture, in so far as it is an attempt to show the common part played by the pituitary body in the disturbances of urine secretion

which we have been considering, may be summarised in diagrammatic form as follows :—



The polyuria following isolation of the mammalian kidney is due to the removal of this organ from the normally sustained antidiuretic action of the secretion of the pituitary body. Diabetes insipidus is due to the divorce of the pituitary body from the kidney, whilst water ingestion in all probability leads to a temporary inhibition in the function of the pituitary, and so to the release of the kidney from its antidiuretic influence ; though the mechanism by which such a physiological inhibition is produced is, at the present time, by no means clear.

It is fascinating to think that the kidney, during the appearance and disappearance of the polyuria which we have been considering, may be recapitulating in the course of a few hours a retreat towards and an advance from the state in which our kidneys functioned in those far-back days when, eft-like, we crawled from the water to pursue our phylogenetic development on land.

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THE USE OF AVERTIN FOR ANÆSTHESIA.

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AVERTIN was first made by R. Willstätter and W. Duisberg in 1926 and introduced into practice by Prof. F. Eichholz. Later he requested Dr. H. H. Dale to further the trial of it by English anæsthetists, and the matter was brought before the Anæsthetics Committee set up by the Medical Research Council and the Section of Anæsthetics of the Royal Society of Medicine. Through this committee, of which we are both members, we have been enabled to obtain supplies of the drug, which is not yet on the market in the ordinary way, from Bayer Products Ltd., and to facilitate the supply to others who wished to try it. These investigators, Basil Hughes, F. J. Morrin, and F. P. de Caux, have kindly sent us their reports. The substance of these is incorporated in this paper, which we are publishing at the request of the Anæsthetics Committee.

Chemical and Physical Properties of Avertin.

Avertin is tribromethyl alcohol (CBr_3CH_2OH), a white crystalline powder soluble with difficulty in water at body temperature to the extent of 3·5 per cent. In making the solution prolonged shaking is needed to avoid the formation of lumps. For anæsthetic purposes it is used per rectum. It has a slightly brackish taste and smell. The solution is unstable and therefore must be prepared shortly before use. If it decomposes dibromacetaldehyde is formed, which is highly irritating to the intestinal mucous membrane. In order to be sure of the purity of the solution it is tested immediately before use by adding two drops of 1–1000 Congo red to 5 c.cm. of the solution. No blue coloration must be produced.

Obviously the preparation of a solution which required such considerable time and care—taking as a rule about three quarters of an hour—was a practical disadvantage to the use of avertin. This has been got over by the makers, who now provide a fluid avertin, a liquid in which the solution of avertin is kept stable by the presence of amylene hydrate. All our earlier cases were conducted with solutions made from the powder, all the later with the fluid avertin. We find little difference in the behaviour of the two as regards their anæsthetic nature, but the fluid preparation seems more effective and less likely to be attended by respiratory depression. The "fluid avertin" provides one gramme of avertin in each cubic centimetre of the liquid. The solution for injection is made by adding distilled water at 40° C. The two must be well shaken or avertin is apt to crystallise out, but the preparation of the necessary amount and testing is now only a matter of a few minutes. Although "fluid avertin" is itself stable, strict care is still necessary in preparing the solution with distilled water for rectal injection. The proper heat 38°–40° C. must not be exceeded, and the Congo red test must be applied before injection. We have carefully investigated the stability of the solution for injection and find that it remains undecomposed for at least 48 hours at ordinary room temperature.

H. Gainsborough and J. A. Gardner kept a solution of solid avertin, 3 per cent. strength, made in distilled water at 32° C. at ordinary room temperature for 14 days. At the end of that time it was still neutral to Congo red. The solution was then raised to boiling-point, after which it showed acidity to the same test. Liquid avertin under the same conditions showed no decomposition at the end of five days. Some of the solution was then placed in a quartz vessel and exposed for 12 minutes to the light of an iron arc, after which it showed the presence of a trace of mineral acid.

The practical deduction from the above investigations is that if the solution of fluid avertin prepared for injection is kept at a temperature of about 32°–38° C. and not exposed to light it may be used even several days after preparation. The results referred to are confirmed by some experiments carried out at Guy's by E. Williamson.

If allowed to cool avertin crystallises out and, of course, if the solution is heated much above 40° C. decomposition readily takes place. The hydrobromic acid thus formed is at once detected by the Congo test, and we believe in practice that the use of this simple test of the solution just before injection completely prevents any danger from the use of an impure liquid.

In no patient of our series have we had any evidence of local damage or irritation to the bowel from the injection, an important consideration with all rectal anæsthetics. The use of paraldehyde, for example, has been by no means equally free from accidental damage to the lining of the bowel.

Results of Administration.

Although the number of cases (198) on which this account is based is not great, yet we think that they are enough to provide a sound basis for estimating the true value of avertin. For the patients have been subjects of a wide range of operations, from simple measures such as ligature of piles to laryngectomy, gastrostomy for carcinoma, hysterectomy, and thyroidectomy for exophthalmic goitre, and we have purposely chosen not only typical examples of healthy persons at various stages of life, but also those who were essentially poor subjects for operation and anæsthetics. The two fatalities which we met were both in subject

of the latter class. In one we consider that avertin can be wholly exonerated. In the other it is probable that it played a part, but just how important a part is by no means clear. As, however, in the early days of a new anæsthetic all cases are important which tell against it at all we give details of these two.

The first of these two patients was a woman aged 26, the mother of one child, suffering from a severe degree of mitral stenosis and aortic regurgitation. She was dyspnœic and cyanosed. Her weight was 9 st. 2 lb. She was seven months' pregnant and after a consultation it was decided that the pregnancy must be terminated and that at the same time, with a view to future safety, the patient should be sterilised. A subtotal hysterectomy was decided on as the best measure. The patient's condition as to circulation and respiration made it appear highly improbable that she could survive any inhalation anæsthetic. The choice was held to lie between a spinal injection and avertin. The latter was chosen and a dose of 5·8 g. in 200 c.cm. distilled water was administered at 10.35 A.M., after gr. 1/3 omnoform half an hour previously. At 11.5, when moved to the operating theatre, the patient was muttering and not fully unconscious. Ten drops of chloroform-ether mixture were given from an open mask. The further progress of the case is indicated by the following notes :—

11.14 A.M. : Corneal reflex still brisk and the dose of C.E. repeated.
11.15 : Slight movement of legs on cleaning up abdominal skin ; no further anæsthetic given.
11.17 : Skin incision—a slight movement of legs. Patient slightly cyanosed.
11.19 : Uterus delivered.
11.20 : Tubes clamped.
11.22 : Oxygen administered.
11.24 : Colour improved. Pulse 112, strong.
11.26 : Uterus removed.
11.30 : Corneal reflex perceptible ; pupils small.
11.51 : Peritoneum being closed ; corneal reflex brisk ; slight movement left hand.
12.8 P.M. : Operation completed. Pulse 129 ; respiration-rate 34 ; colour fairly good. Surgeon regarded anæsthesia during operation as perfectly satisfactory.
12.20 : Patient back in bed.
1.10 : Patient conscious ; condition fairly good, but many moist sounds in chest.
3 : Condition not so good. Much coughing of frothy fluid and pulse very rapid. Hypodermic of atropine, gr. 1/50.
3.20 : Pulse 140, respiration-rate 36. Cyanosis ; oxygen given for ten minutes.
3.45 : Patient gradually became unconscious ; caffeine injected. Died at 4.15 P.M.

Post-mortem examination showed aortic incompetence, the aortic cusps being thick and incompetent, mitral stenosis of a high degree, and lungs with much œdema but no consolidation.

The other case was of quite different type. The patient was a coster, aged 54, weighing 12 st. 11 lb., complaining of a large tumour of the neck and hoarseness. The diagnosis was a large cystic adenoma of the thyroid with compression of the trachea. The patient was thickly built, with highly coloured face, short neck, and fat abdomen—obviously a difficult subject for anæsthetics. It was thought that the use of avertin by abolishing or greatly diminishing the inhalation anæsthetic would be of great service. He was given omnoform, gr. 2/3, at 12.30 P.M. and avertin at 1.50. The dose injected was 8·57 g. in 250 c.cm. of water at 40° C. (i.e., 0·125 g. per kg. of body-weight). It was noticed that the omnoform had produced no drowsiness at the time of giving the avertin. Unconsciousness was produced without any excitement and at 2.10 the corneal reflex was gone.

The operation was begun at 2.30. The skin-cut produced very slight reflex and no general anæsthetic was administered. By 3 o'clock the cyst was completely freed and the patient's stertor ceased. There was considerable trouble with bleeding before the operation was finished at 3.20. When the dressings were about to be applied it was seen that some bleeding into the wound was still going on, so the stitches were removed, the wound reopened, and the bleeding satisfactorily dealt with. At 3.35 the skin was sewn up and dressings put on. The man's condition throughout had been good and no anxiety had been caused by the hæmorrhage. Anæsthesia was all that could be desired. The subsequent notes supplied by the house surgeon were as follows :—

6.30 P.M. : Corneal reflex not returned, pupils contracted. Pulse 120 ; tends to be irregular. Respirations not deep, but quite regular. No cyanosis. Rectal salines administered.
12 midnight : Slight corneal reflex. Pupils still small. Pulse and colour good. Does not reply to questions.
6 A.M. : Breathing not so good. Pulse poor in volume. Stimulants ordered.
9.30 A.M. Heart failure. Respirations shallow, but regular up to the time of the pulse failing. Artificial respiration and strychnine did not have effect.

The facts of this case suggest that a perfect anæsthesia on the table was procured at the price of an overdose. The dosage of avertin employed (0·125 per kg.) has often been exceeded with safety, but it is possible that in conjunction with the effect of omnoform, gr. 2/3, it was excessive. On the other hand, the patient was a bad type of subject, and it is possible that his heart would have given out after the operation even had this been performed with an ordinary inhalation anæsthetic, or with an intratracheal administration.

Premedication and Administration.

The German workers almost without exception gave their patients a dose of veronal or some similar drug on the evening before operation. We have consistently omitted this, and have not found any reason for adding the extra sedative. We have used as a routine either morphia-atropine or morphia-scopolamine (F. E. S.), or else omnopon alone (J. B.), given one and a half to one hour before operation. Our experience is that these hypodermic injections enable a weaker dose of avertin to be effective than that which can be successful without their aid. The rectum should be washed out the evening before operation, and it is important not to have this repeated within a few hours of giving the avertin.

We have found that with the ordinary routine preparation of patients for operation, and a rectal wash out with simple water on the evening before the day of operation, conditions have been perfectly satisfactory for the use of avertin any time between 9 A.M. and 1 P.M. on that day. The patient lies in bed on the left side and the avertin solution at a temperature between 35° and 40° C. is slowly run in from a funnel through a small calibre soft rubber tube or catheter. This should be vaselined and passed at least four inches beyond the anus. Not less than ten minutes should be spent in introducing the solution. After it is all in, the tube may be clamped and left in position, or withdrawn and a tampon of cotton-wool with boric ointment applied. It is a great advantage if the anæsthetist can himself be present when the injection, which is entrusted to a nurse, is carried out. He may be able, by noticing the onset of unconsciousness and the general reaction of the patient, to reduce the prescribed dose, as we have several times done, or, on the other hand, he may realise the necessity for additional anæsthetic later. In any case the person entrusted with the injection must be sufficiently skilled to be safely entrusted with a deeply unconscious patient. She must know how to prevent mechanical obstruction of the upper air passages, for the tongue is easily drawn back with inspiration so as to obstruct the larynx, in the patient fully under avertin, just as it is in the case of inhalation anæsthetics. There is, however, none of the local congestion associated with inhalation anæsthetics and consequently the airway is more easily preserved.

Dosage.

The dose used has been between 0·09 and 0·15 g. per kg. of the patient's body-weight, given in a 3 per cent. solution with distilled water. One of us (J. B.) has used, except in his first few cases, nothing but the dose of 0·1 g. per kg. always preceded by gr. 1/3 of omnopon. All the evidence so far secured shows this to be a safe procedure. On the other hand, the anæsthesia obtained is, of course, often inadequate

and has to be supplemented, usually by a little ether. One-third of the cases required no anæsthetic in addition to the avertin. By stronger doses of avertin, 0·13 g. and 0·15 g. per kg., the necessity for additional anæsthetic arises less often (F. E. S.).

The question of the correct dose is the most difficult one in connexion with avertin, as indeed with any rectal anæsthetic. If only a perfectly safe amount is injected this will often be inadequate and will have to be helped out by inhalation or by local analgesics, the method favoured by Mr. Basil Hughes. If, on the other hand, maximum doses are employed, although the anæsthesia will much more often be adequate without any supplementary method, yet the risk of overdose must necessarily be great. For gauging the dose by the body-weight is, after all, only a rough guide, and we all know the varied way in which different patients react to narcotic drugs, although the reason for the difference in their behaviour is generally obscure. Consequently we believe that the former of the two methods mentioned should be followed and that avertin should be used to provide the induction of narcosis and an excellent basis on which with comparatively little inhalation a perfectly satisfactory anæsthesia can be established.

Another safe method that has been much practised by some German surgeons meets with the approval of Mr. Morrin, who has used it with success. This is what is called fractional administration. A dose is first given equivalent to 0·1 g. per kg. of body-weight. If after 15 minutes the patient is sensitive to pain a further dose of 0·025 g. per kg. is given, and this is repeated if necessary till the maximum of 0·15 g. per kg. has been injected. This method requires that the rectal tube is kept in position and, of course, there may be some inconvenience in continuing the injection on the operating table. We have preferred the method of reinforcing the narcosis of avertin when necessary by inhalation anæsthesia. Sometimes gas and oxygen has been used, but most often a small amount of open ether or of C.E. mixture.

Effects of the Injection.

Avertin is rapidly absorbed from the bowel. Symptoms are generally produced within a few minutes, and we are satisfied that the whole amount introduced does actually leave the bowel, because we have in many patients had the bowel washed out after return to bed and the wash-out carefully examined for avertin. None has ever been discovered. Morrin has recovered some fluid when the bowel has been washed out within 40 minutes of the injection. We have never washed out as soon as this, believing that it takes about 45 minutes for the whole injection to be absorbed. Consequently we do not think there is any advantage in leaving the rectal tube in situ for the purpose of withdrawing avertin solution should symptoms of overdose appear in long operations.

Avertin produces unconsciousness more quickly and quietly than any similar drug with which we have had experience. We have seen no example of excitement nor any evidence of unpleasant taste or other sensation. The usual process is that after a few minutes the patient's eyes close and he responds languidly to questions; usually within 15 minutes he does not answer at all. If his eye reflexes are now tested the conjunctival is quite absent and the corneal usually so, too. The pupil is very small, but reacts to light. The general musculature appears relaxed. Respiration is quiet and regular, often with stertor from the relaxed jaw and tongue, and the pulse is in accordance with the breathing. There is slight fall in blood pressure, usually about 10 mm. Hg. It is greater in proportion as the strength of the dose is increased. The colour remains normal if due care is paid to the airway. If the patient is now, some half hour after his injection, placed on the operating table his appearance suggests that he is fully anæsthetic. The application of iodine or picric acid and of the towel clips will, however, often elicit slight reflex movements, and then a small amount of general anæsthetic had better be at once given before incision. The amount required will be quite small (e.g., 2 drachms of ether on an open mask) and may not have to be repeated. On the other hand, we have had to use as much as 7½ oz. of ether.

Another test for the real depth of narcosis which has been found useful is to apply an open mask, well wetted with ether, close to the face. If there is no alteration in the breathing, from irritation of the larynx, the operation can be begun without fear of any inconvenient movement on the patient's part.

In the course of operation we have found no untoward effects of avertin on the respiration or circulation. The breathing goes on quietly and regularly. The blood pressure has never fallen more than 30 mm. Hg unless the severity of the operation itself produced a fall. We have never had to apply any kind of restorative measures on the table. Apparently those most likely to be required are direct respiratory stimulants (lobeline or CO_2) or else ephedrine to restore blood pressure. The above description of the effects of avertin is true of the vast majority of cases. The exceptions have been provided by alcoholic subjects. In these nothing more than a stupefying effect may be obtained, with an associated amnesic effect, so that next day, although a large amount of general anæsthetic has been given, the patient remembers nothing after the rectal injection.

Recovery Period.

The patient remains unconscious generally for about three hours after return to bed. During this time, however, the corneal reflex is brisk and the sleep is light, so that probably it could be broken if necessary by any violent stimulation. The importance of this is that during this period foreign matter probably could not enter the larynx without being ejected, and we do not think that avertin need be avoided in operations which involve the air passages for fear of inhalation of blood afterwards. For these cases, however, it would probably be safer to omit all preliminary sedative medication.

Mr. Morrin's operations, a large proportion of which were diathermic coagulation for extensive carcinoma of tongue or tonsil, bear favourably on this point.[1] His remarks may be quoted that "avertin anæsthesia, by allowing accessibility to the growth and free intra-oral manipulation, marks a great advance in the operative treatment of lingual and oral carcinoma."

The after-effect of avertin is really more a prolonged period of analgesia and amnesia than a true unconsciousness, and this long period of freedom from pain is often an advantage. Chest complications have been absent, as was expected, since elimination of avertin does not take place through the lungs. It is got rid of by way of the liver and kidneys in combination with glycuronic acid. Assuming that it appears in the urine as a glycuronate, in four or five cases Gainsborough and Gardner made daily analyses of the urine for two to four days and accounted for from 20 per cent. to 64 per cent. of the avertin administered. They concluded, however, that the methods of estimation were unreliable and required further investigation. German observers have found as much as 80 per cent. Attempts were made to determine the amount of avertin in the blood, based on the quantity of combined halogens, but the differences were so small as to be within the errors of experiment.

After-effects have been noticeably absent. There has been no affection of the lungs when avertin only has been used, nor indeed, with slight exceptions, in the other cases which had supplementary anæsthetics. One of these patients (de Caux), after a gastro-enterostomy carried out with avertin and gas and oxygen, developed purulent bronchitis from which he recovered. This man had 0·125 g. per kg. and remained cyanosed for nine hours after operation and was still drowsy after 24 hours. Nausea and vomiting in the great majority of cases have been absent.

[1] See THE LANCET, March 2nd, p. 448.

Conclusions.

There appears to be no contra-indication to the use of avertin on the score of age. Basil Hughes speaks enthusiastically of its use for children, combined with infiltration anæsthesia, and some of our own most satisfactory experiences have been with aged persons. Nor does any state of bodily health, except rectal disease, apparently forbid its use. Cachectic, feeble persons suffering from carcinoma of the œsophagus have undergone gastrostomy under avertin anæsthesia with complete success, and the same result attended an operation for gall-stones in the jaundiced subject. Nevertheless we would not use the drug if the liver or kidneys were known to be seriously diseased.

We believe that its use has especial value: (1) for patients who dread the anæsthetic, or have suffered after former anæsthetics; (2) for the subjects of exophthalmic goitre, or others in whom the psychic aspect of the matter is of real import; (3) for patients who have to undergo long operations not requiring very deep anæsthesia—e.g., long operations on bones, plastic operations, laryngectomies; (4) for injections for trigeminal neuralgia; (5) for patients who suffer from any pulmonary complaint; and (6) in prolonged operations about the head and neck. We do not think avertin, being administered by a single dose method, should be used for operations likely to cause rapid fall of blood pressure.

We consider avertin to be a valuable addition to the drugs at the disposal of the anæsthetist, and that if used with due care and moderation its advantages can be taken advantage of with perfect safety.

We wish to acknowledge the assistance of members of surgical staffs of Guy's and St. George's who have kindly allowed us to use avertin for operation cases; and also the valuable help given to one of us by Mr. G. Edwards and Mr. L. N. Lewis, resident anæsthetists at St. George's.

AIR-TIGHT SUCTION DRAINAGE OF THE CHEST.

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Resection of a piece of rib for the purpose of draining the chest has been a life-saving operation, and the procedure may be regarded as a milestone on the road of thoracic surgery. Nevertheless this method will not save every patient who has an empyema, and in certain conditions the mortality which follows open drainage of the chest is too high to be regarded with complacency. For example, in very young and in old sufferers open drainage is not a satisfactory therapeutic measure, and it falls short in the cure of infective pleurisy associated with pneumonia or other grave concomitant lesion, and in the acute septic effusions which are not bounded by pleural adhesion prior to the opening of the chest. The mortality which attends rib resection in these cases, and the complications which are apt to follow, have received full recognition, and many attempts have been made to elude the drawbacks by effecting some form of drainage which would allow the egress of septic fluid from the chest while preventing the ingress of air to the pleural cavity. For the most part these endeavours have not been successful, but a real step forward was made by Poynton and Reynolds,[1] who, under the title of a Method for Diminishing Mortality in Empyema in Infancy and Childhood, introduced a technique which they had devised with the special object of emptying the pleural cavity and maintaining continuous drainage by aspiration without at any time exposing the cavity to the outside air and secondary infection. Poynton and Reynolds use a special trocar and cannula. The latter is fitted with a broad flange which fits against the chest wall, and suction drainage is effected by means of a rubber tube which fits the cannula tightly, having been passed through it while on the stretch, like a self-retaining catheter, and which is connected up with a White's continuous suction apparatus (Fig. 1). The object of the present communication is to propagate the views and method of Poynton and Reynolds, to advocate their application to the treatment of empyemata in adults, and to offer a few suggestions appropriate to the practical side of the question.

[1] The Lancet, 1921, ii., 1100.

With regard to the advantages of continuous air-tight suction over rib resection in the treatment of these infected pleural effusions in children I will take the liberty of quoting freely from the original paper by Poynton and Reynolds. They mention the following:—

1. The period of illness is shortened. In cases treated by rib resection the average time before the wound is healed is six weeks; with the method described above the average time between insertion of the cannula and complete healing has been 15 days. The explanation of this advantage is that:—

2. There is no secondary infection of the pleural cavity. The rubber tube has a larger lumen than the cannula, so that, when released from the introducer, it expands and fits the cannula tightly, preventing any leakage of pus, soiling of the wound, and reinfection backwards to the pleural cavity. Another important point in the shortening of the illness is that osteomyelitis of the rib, so common after resection, does not occur.

3. No anæsthetic is required. The whole procedure can be carried out in a few minutes, causing very little disturbance and without removing the patient from bed, thus eliminating all the risks attendant upon moving a seriously ill child to the theatre and giving an anæsthetic.

4. Surgical trauma and its consequent shock are reduced to a minimum. The pain and discomfort of inserting the trocar are no more serious than exploration with a needle.

5. No daily dressing is required. Those who have seen what mental and physical suffering so many children endure for weeks after resection of rib will readily appreciate what a relief this method will be to all concerned.

6. The patient can assume any required position without fear that drainage will be interfered with.

7. The drainage is continuous and complete. Pus cannot collect in the bottom of the cavity and depend upon the position of the patient or upon expiratory efforts for its expulsion.

8. Expansion of the lung is assisted. The suction produces a negative pressure of 8 mm. Hg; this being more than the normal negative pressure of the pleural cavity, the lung tends to expand and assume its normal function more readily.

9. The removal of the pus is gradual. The continuous suction causes a steady slow outflow of pus, and it is some hours before the cavity is emptied; a displaced heart is thereby allowed to reassume its normal position quietly and gradually without the suddenness which is bound to occur if incision and drainage are employed. This fact is important when one recalls cases of syncope due to sudden withdrawal of pus and the replacement of a displaced heart.

To this long list of advantages may be added:—

10. A recovery which is complete and unclouded by any necessity for those subsequent operations for decortication of a collapsed lung and extensive resections of rib that are sometimes required in order to obliterate the septic cavity remaining after the old operation, even when it has been "successful." The patient who, by suction drainage, has surmounted the immediate danger of an empyema will be free to thank Providence whole-heartedly for his recovery—a happy lot which, as we all know, does not invariably fall to those who have undergone treatment by open drainage.

11. Lastly, and perhaps most important of all, is the avoidance by air-tight suction drainage of any spread whatever of the area of pleural sepsis. With an open operation, on the other hand, accompanied as it must be in non-localised effusions by some separation of layers of pleura previously in contact, a spread of pleural infection is unavoidable.

The Drawbacks.

1. *A delirious patient may pull out the tube.*—This happened in a patient of mine, aged 54, in whom a right-sided empyema supervened on a double pneumonia. Luckily the hole through which the tube had been removed remained air-tight. A fresh catheter was inserted into the empyema cavity at a point as remote as possible from the former puncture and an uneventful recovery ensued—uneventful, that is to say, except for a local cellulitis of the chest wall which, however, quickly subsided without causing great constitutional disturbance and without necessitating any incisions.

2. *Cellulitis of the chest wall.*—This remains the one hitherto ineradicable drawback to the method. With the precautions which will be mentioned presently I do not believe the danger to be very great, even in cases of acute hæmolytic streptococcal infection, in which it is of the utmost importance to avoid any spread of the pleural infection such as is bound to occur with open drainage. In any case, a cellulitis of the chest wall is less likely to kill the patient, and is more easily dealt with than a wide-spreading streptococcal pleurisy accompanied by collapse or contraction of the lung and by profound toxæmia.

3. *Insufficient drainage due to blockage of the tube.*—This is largely a myth used for purposes of destructive argument. The suction does sometimes fail to be effective, and this may be due (supposing the disease to be still active) to one of two causes—namely: (*a*) the drainage-tube may be obstructed by a mass of fibrin, or (*b*) the tube may be inserted at too low a level in the chest wall, in which case, as the empyema cavity diminishes in size, the dome of the diaphragm comes into contact with the chest wall and so shuts off communication between the residual pleural fluid and the rubber drainage-tube.

(*a*) Blockage by fibrin is to be dealt with in this way. The drainage-tube is secured with a clip to prevent the entrance of air, and is then detached from the suction apparatus. Then, with a glass syringe, a few ounces of warm solution of eusol (I have used diluted "Milton" for the purpose) is slowly injected into the pleural cavity, the clip on the drainage-tube having been removed for the purpose. The suction apparatus is then connected once again with the drainage-tube. If recurrent blocking occurs this treatment may be repeated.

(*b*) The more common cause of defective or intermittent drainage is contact of the diaphragm with the chest wall above the drainage-tube owing to the latter being too low down, especially if the opening happens to have been made in the mid-axillary line or in front of it. The diaphragm comes readily into contact with the chest wall as high as the sixth rib in the mid-axillary line and the eighth rib in the posterior axillary line, so that if a tube be introduced at or below these levels it must be thrust far enough into the pleural cavity to avoid the possibility of its being smothered by the diaphragm. Supposing the worst to happen, and that suction drainage cannot be established, even by trying the remedies and observing the precautions just mentioned, or by inserting the tube at a different place in the chest wall, it will still be possible to resect a rib and perform open drainage. And when the surgeon is skilled, as every modern surgeon must be, in the use of local anæsthetics, the patient will have been put to very little pain and inconvenience by the previous efforts to drain his chest.

4. *The apparatus is unwieldy and tiresome to use.* The apparatus is cumbersome, but to admit this as a factor in our choice of therapy is to place the convenience of the medical attendant before that of his patient. In practice the method is not at all tiresome—far less so than the frequent dressing of an open empyema wound. The large reservoir supplying the hydraulic pump will only need refilling once in 12 hours or thereabout—a trifling labour—that is to say, with the interrupted stream flowing properly at the rate of between 60 and 100 drops in each minute.

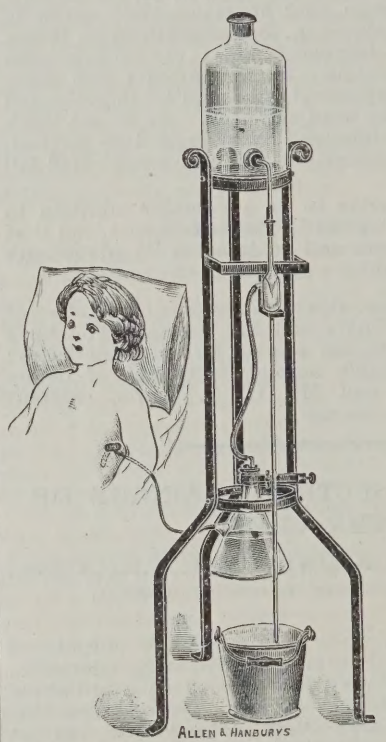
5. *The possibility of damaging the diaphragm or lung with the large trocar.*—I have feared the danger, though I have not experienced the accident. As a measure of safety I had a set of trocars made for me with truncated points, but these have the disadvantage that they will not always perforate the parietal pleura, to achieve which a narrow-handled tenotome will be necessary. Perhaps I have been unwarrantably apprehensive of this supposed danger when an ordinary trocar is used.

Alternative Procedures.

(1) It may be argued that in a case of infected pleurisy, especially when this condition is due to the pneumococcus, it will be desirable to open the chest widely in order to clear out the large masses of infected fibrin. This seems sound enough. I have suffered from repentance and remorse after an apparently successful operation of this kind, which at the time seemed most satisfactory, handfuls of clot having been found in the pleura and removed, but the death of the patient put me in the wrong. The fact is, that these large thoracotomies not only require considerable experience and skill for their performance, they not only demand as an essential the use of intratracheal anæsthesia or of a pressure chamber, but the operations are very severe on the patient, who may easily be overwhelmed by such a drastic remedy. Moreover, the test of experience will almost certainly prove that air-tight suction drainage is curative for these patients, and in the face of experience all hypothetical suppositions must be relinquished.

(2) Siphon drainage has been tried in place of active suction. That is to say, a drainage-tube is inserted into the pleural cavity through a trocar

FIG. 1.



Apparatus as used by Poynton and Reynolds. The present author differs in not using a retained cannula.

FIG. 2.

Dowse's self-retaining catheter with expanded end.

the other end of the tube being allowed to hang down over the edge of the bed into a bottle of antiseptic lotion standing on the floor. In practice, again, this alternative does not fulfil as it should the theoretical hopes which have so often been based upon it. The method is too seldom attended by success and cannot be regarded as an equivalent of, or as a substitute for, active suction, and the same drawback of ineffectiveness attends the use of valvular drainage.

When the pleura is acutely infected by hæmolytic streptococci there is but one alternative to air-tight suction drainage, and that is repeated aspiration, for it is now generally recognised that open drainage by rib resection in this type of case is a grave surgical error. Unfortunately, it is in these very infections that there is the greatest danger of cellulitis of the chest wall, and this danger accompanies both repeated aspiration and suction drainage. The actual risk from this complication, although not to be ignored, has been exaggerated; for we are not destitute of measures to deal with it.

Technique of the Operation.

Though following in the main the methods of Poynton and Reynolds, there are a few small modifications which I should like to suggest. The operation is done, of course, without moving the patient from his bed, the local anæsthetic used being 1 per cent. of novocaine in a 1 in 15,000 watery solution of adrenalin; this should be freshly prepared. A fine-bored needle is used, to minimise the danger of infecting the chest wall from within through puncture of the pleura. I prefer to enter the trocar near the posterior axillary line. The ribs are wide enough apart here to admit of the passage of a fair-sized tube, while the drainage is not so likely to become obstructed by the diaphragm as it would be if the puncture were to be made in the mid-axillary line or further forward still. For the purpose of drainage a Dowse's self-retaining catheter is chosen which is slightly larger in section than the cannula through which it is to be introduced (Fig. 2). These measurements are tested by a catheter scale so as to avoid any visual fallacy. The object of having the outside measurement of the catheter larger than that of the cannula is to ensure that there shall be no leakage of pus between the tube and the walls of the wound after the cannula has been removed. There is, of necessity, some soiling of the wound track during withdrawal of the cannula. To mitigate this, the self-retaining catheter is soaked beforehand in a 1 in 1000 aqueous solution of acriflavine, which is potent in suspending freshly initiated sepsis. After the trocar and cannula have entered the pleural cavity and before the trocar is withdrawn, a pad of cotton-wool soaked in methylated spirit is wrapped round the cannula where it is in contact with the skin, so as to prevent a surface wound infection from overflowing pus. The trocar is now withdrawn, and a finger is immediately placed over the open end of the cannula to prevent any outflow of pus. The self-retaining catheter is now quickly inserted on an introducer, and first the cannula and then the introducer are withdrawn, and as speedily as possible the catheter is connected with the suction apparatus which has already been set going. This, indeed, is almost exactly the technique used to effect suprapubic drainage of a paralysed or infected bladder, and is, I think, much superior to the plan of leaving a rigid cannula in the chest wall through which the drainage-tube is passed. The kind of self-retaining catheter selected is one in which the expanded end is in unquestionable continuity with the trunk of the catheter and is not formed from a separate piece of rubber subsequently vulcanised to the main body, for such an end might conceivably become detached and lost within the patient. Therefore a Dowse's self-retaining catheter is used; in this the continuity of the tip and body of the catheter is unbroken, and no danger of detachment of the expanded end can arise.

In view of the success which has been attained by air-tight suction drainage of empyemata and infected urinary bladders it may be well to test the method in the treatment of other acutely infected cavities—for example, in septic arthritis of the knee-joint. That, however, is a mere suggestion and is not germaine to the present article, the aim of which has been to call renewed attention to Poynton and Reynolds's suction treatment of pleural sepsis, and to add to their advice some small additional details of technique which may be of use to those who will undertake the operation.

SOME SECONDARY MENTAL STATES

AND THEIR SIGNIFICANCE.

BY R. G. WALMSLEY, M.B. LIVERP.,
ASSISTANT HONORARY PHYSICIAN, LIVERPOOL PSYCHO-THERAPEUTIC CLINIC.

THE conditions best described as "secondary mental states" are fairly common and of considerable interest. A few years ago no attempt was made to distinguish between their variations—hence the prevalence of such vague terms as "trance" and "swoon"—and the general public had a deeply rooted tendency to regard them as associated in some way with the charms and spells of witchcraft and magic. Now the pendulum of fashion has swung far in the opposite direction; everything mysterious is being put into its place according to the principles of a strict scientific determinism, and all such substates of consciousness, when they come within the province of the general physician, are labelled epileptic or migrainous, choreic or post-encephalitic, hysterical or psychasthenic according to the associated signs and symptoms and the individual predilections of the physician. Some clinicians, again, are content simply to regard these secondary mental states as toxic, or vascular, or endocrine in origin; others look upon them as the inexplicable concomitants of a potential psychosis. Nevertheless, the vast majority of them remain under the category of "functional disturbances of unknown origin," and the position is far from satisfactory.

It is essential at the outset clearly to define the conditions. They are characterised by some variation from the normal state of consciousness in which consciousness, as one usually understands that term, is retained, and in which evidence of gross mental derangement is absent. This definition therefore excludes all conditions in which consciousness is lost entirely, such as normal sleep, pathological coma, and syncope, and also those states of complete disorientation and inapperception of reality which characterise the psychoses.

Symptoms Objective and Subjective.

Observed objectively, the conditions under discussion are characterised in the slightest cases by a transient failure of attention, an apparent preoccupation, a fixed staring expression, and some immobility in the general attitude. Upon closer observation some dilatation of the pupil may be noted, together with a change in colour and some variation in the respiratory rate. Often the objective evidence of the condition is limited to a few of these signs, but in severer cases more remarkable changes can be recorded; the patient's behaviour becomes quite obviously odd, and he may show signs of perturbation and distress. The eyes may be rolled upwards, some word or expression may be muttered half audibly, the hands may be clasped in a curious wringing movement, while the respiration assumes a peculiar sighing character. In a few yet rarer instances the individual conducts himself in an entirely strange and inappropriate manner; his character appears to be altogether altered, and his affective tone and reactions to have been completely changed from those of his normal conscious state.

After a variable time he becomes himself again, and may then display a complete amnesia for the period of the change. Between those cases in which only the slightest change is observable and these extreme examples of dual personality there is a gradation of cases of all shades of intensity, demonstrating that the essential change is the same in all and that the varying symptomatology merely indicates the degree to which the process extends.

Subjectively, the symptoms are of even greater interest. Almost every apparently normal individual can recall curious phases of day-dreaming in which the thoughts revert to a more primitive phase than ideation, and in which adaptation to the conditions of external reality is less complete than at normal times. One may be expressing one's thoughts quite adequately in conversation when suddenly and without any apparent cause one loses the thread of one's argument, hesitates for the appropriate word, and is compelled to bring one's sentence to a premature conclusion; in these circumstances one usually experiences an unpleasant feeling of confusion and incompleteness. Passing from the relatively normal to the more definitely abnormal the subject describes a curious sense of unreality, a sensation as though the present situation were somehow the repetition of a similar situation in the past in which he is compelled to enact a painfully passive, automatic rôle; he may feel as though a pause had occurred momentarily in the eternal march of time, or in the rhythmic pulse of the universe, as he may fancifully express it. Objects appear to him abnormally large or abnormally small, as though viewed "through the wrong end of a telescope." A number of curious sensations, visual and auditory, visceral and cutaneous, may sometimes be elicited, and not infrequently a sense of panic, as of some awful imminence, is experienced. The whole period does not usually exceed a few minutes, and frequently its duration is measurable in seconds. In a few severe cases, however, the condition persists for several hours, but such cases are quite exceptional, and as a rule the previous tempo of life is quickly resumed, and all goes on as before. At times no subjective sensations can be elicited, but the patient may appear somewhat confused on being questioned.

Current Medical Opinions.

All these symptoms and signs are most carefully sorted out, labelled, and described under the symptomatology of a number of syndromes. In my opinion they simply indicate a substate of consciousness, and should not thus be sorted, classified, and arranged so as to form so many separate clinical pictures. They ought to be considered as a group, closely interrelated and comprising in its totality a quite definite clinical entity—in fact, a complete syndrome in its integral whole. In the text-book classifications and symptomatologies essentially the same condition—namely, some manifestation of the secondary mental state—masquerades under many names and in many guises: as the aura to grand mal, as an attack of petit mal, as an epileptic equivalent, as a post-epileptic automatism; as a visual fortification phenomenon indicative of migraine; as some form of oculo-gyric or hyperpnœic crisis suggesting encephalitis; as the cerebral manifestation of disseminated sclerosis; as the subjective symptom of vasomotor instability or of a deranged blood pressure; as one of the gamut of functional disorders ascribed to chronic toxæmia, to anaphylaxis, or to an endocrinous dyscrasia, according to the prevailing fashion; as the disturbance in movement, sensation, and memory of an hysteric; as the depersonalisation, doubts, and tics of a psychasthenic; as the light-headedness and confusion of a mild toxic psychosis; as the introspection of a neurasthenic suffering from anxiety; as the introverted phantasy of an early dementia præcox. In each case certain outstanding phenomena are extracted from the fundamental psychic state responsible for their existence, and then these phenomena, divorced, as it were, from their context and having in reality no significance per se at all, are claimed individually as important symptoms pathognomonic of many widely differing syndromes.

Failure of Cohesion in Consciousness.

Now it seems apparent that in each one of these functional disturbances for the production of which no adequate organic cause can be discovered in the vast majority of cases the essential element is fundamentally the same. True, it is interpreted rather differently by the patient according to his individual powers of observation, apperception, and self-expression; it is also tinged in each case by the local colour of any other physical symptom with which it may be associated, as, for example, headache, vomiting, or palpitation, but allowing for all these shades of variation the symptomatology really shows a remarkable degree of uniformity. My contention is that these conditions are all simply manifestations of some change in the functioning of those mental processes which combine to produce the totality of the phenomena of consciousness; they have one common and fundamentally essential character, and this is some failure of cohesion in that integration of psychophysical processes upon which the normal state of consciousness depends. In a number of cases, as in Jacksonian epilepsy and in rheumatic and lethargic encephalitis, a demonstrable pathological lesion is present, and we are justified in assuming that it bears some relationship to the symptom under discussion. The fact, however, that the same change in consciousness is found in a case of organic cerebral disease, in a case of organic non-cerebral disease, in a case of purely psychogenic disorder, and in a normal individual under very varying circumstances, proves that the relationship between the pathological lesion and the change in consciousness is entirely non-specific. In epilepsy the fallacy of regarding the symptomatology as due to some specific physical cause becomes particularly apparent; it cannot be explained in terms of structural changes, nor can subtle variations in consciousness usefully be interpreted by the light of cerebro-topography. Hence the confusion of thought regarding the pathology of such conditions as epilepsy and migraine. This consideration also offers a reason why clinical cases of these diseases so seldom conform to the classical types described in text-books. The differential diagnosis between true and false epilepsy is finally reduced to absurdity by that most assuredly psychogenic of all symptoms, involuntary micturition, the signal hall-mark of fear, clinching the diagnosis of an organic case. The whole process becomes intelligible when one adopts a psychological conception of the disorder, and realises that the primary condition in all these modifications in consciousness is some degree of dissociation, and that the actual line of the cleavage is predetermined by purely psychological factors, while any disturbance in the physiological working of the organism as a whole is able to increase this potential crack into a definite splitting of consciousness. It is not even essential that there should always be some physical or rather physiological, element in the case at all, not infrequently the psychical factor alone is sufficiently powerful not merely to predetermine the line of cleavage but actually to produce the complete split. Usually, however, the actual dissociation does not occur until some physical disturbance plays a secondary part in its production. This disturbance may be of a gross mechanical nature, as in some definite pathological lesion, or it may act simply by disorganising function, as in a metabolic or toxic disorder or an endocrine or circulatory change. A typical secondary mental state may be induced experimentally in predisposed subjects by the purely physical measure of compressing the cervical vessels; on the other hand, a mild but prolonged form of such a state is regularly induced by purely psychical methods in the treatment of suggestible patients under light hypnosis.

It is difficult to assess the part played by physical and psychical factors respectively in the production of

any given case of epilepsy. Those cases of grand mal in which genuine unconsciousness can definitely be established do not come within our definition of a secondary mental state, and remarks upon epileptoid phenomena of other types should not be applied to them. It does not necessarily follow that these remarks are altogether inapplicable, but for the moment this question is not raised. It is, however, recognised that unconsciousness as it occurs in grand mal may be quite independent of any gross physical derangement; in fact, it will admit of a purely psychical explanation.

The Conception of Dissociation.

Returning to those cases with which we are primarily concerned, it becomes evident that the phenomenon of dissociation in consciousness, considered as a psychological conception, becomes the crucial point in the whole subject. Propounded originally by Pierre Janet, the hypothesis was employed to explain the phenomena of somnambulism, hypnosis, dual personality, and all the paralyses, anæsthesias, and amnesias of hysterical patients. The conception of dissociation, as evidenced in these cases, was that of the process upon the molar scale, but soon it was found that its extension to the molecular scale provided a very helpful conception of psychasthenia, with its dominant subjective symptoms of doubt and depersonalisation. The symptoms of hysteria and psychasthenia were thus conceived by Janet to be manifestations of some disintegration in the totality of consciousness. Since normal mental processes depend upon the functional unity of the whole psychological apparatus, any such splitting or dissociation would obviously be incompatible with mental health; but whereas the analogy of dissociation furnishes a static conception of such processes, a more fundamental appreciation of the condition can only be reached by the adoption of the dynamic conceptions of Freud and the psychoanalysts, considered in conjunction with some hypothesis assuming a dissociative diathesis dependent upon some congenital lowering of psychological tension. The extension of the conception of dissociation so as to regard it as the fundamental condition responsible for all those phenomena subsumed under our definition and description of the "secondary mental state" is the thesis of this paper.

The practical application of these considerations is not that physical measures should altogether be discarded from the therapeutics of consciousness. It is, however, urged that when pharmacological and physiotherapeutic resources have been exhausted, it is at least worth considering whether investigation and treatment might not advantageously be directed along psychotherapeutic lines, even when the case can be classified in a non-psychogenic category.

Clinical and Laboratory Notes.

A NOTE ON THIRTY CASES OF CARCINOMA OF THE RECTUM TREATED BY GAMMA RADIATION.

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AND
H. A. COLWELL, M.B., PH.D., M.R.C.P. LOND., D.P.H.,
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BEFORE the development, by Neuman and Coryn of Brussels, of the open method for the insertion of radium in rectal carcinoma, first carried out in this country, we believe, by C. Gordon-Watson, the radium treatment of rectal carcinoma was generally held to be of little if any value. The unsatisfactory results obtained were due to difficulty of access, impossibility of uniform irradiation, inadequate control of lymphatic dissemination by suitable methods of arrage, the relatively slight difference between the adio-sensibility of the normal rectal epithelium and hat of the neoplasm, and the diminished sensibility f the growth due to septic changes. With these onclusions we agree, but hope that a short note upon 0 cases of inoperable carcinoma of the rectum treated t King's College Hospital from 1922 to 1927 may not e without interest, although in all cases the radium as inserted into the lumen of the bowel. All the ases were judged to be hopelessly inoperable, and dium treatment was adopted merely to render the atient's surviving space of life a trifle more tolerable. n every case a preliminary colostomy was performed. The quantity of radium salt ($RaSO_4$) used varied om 150 to 50 mg. and it was enclosed in torpedo-aped platinum iridium containers 0·5 mm. thick. hese were enclosed in another platinum iridium case, so 0·5 mm. thick. Each tube contained approxiately 50 mg. of radium sulphate, and one, two, or ree were used according to the dosage selected. The reened radium tube or tubes were enclosed in a soft bber tube before insertion into the lumen of the wel. It is clear from the filtration that the rectal oplasms were subjected only to gamma radiation. The duration of application varied from 12 to 30 hours.

The number of cases treated by the different quantities of radium were as shown in Table I.

TABLE I.

Cases.	Mg.	Hours.	Cases.	Mg.	Hours.
1	150	12	17	100	18
3	150	18	7	50	24
1	150	20	1	50	30

In the earlier cases, five in number, 150 mg. were used for 12, 18, 18, 18, and 20 hours respectively. In the first three reaction was severe, with pain, rise of temperature, and sloughing of the growth; the fourth, though showing but slight constitutional reaction at the time, died of secondary hæmorrhage in two weeks. The fifth case, where the radium was left in situ for 20 hours, showed but moderate reaction, and there was no appreciable ultimate effect on the neoplasm itself. The patient in whom 150 mg. were inserted for 12 hours, while exhibiting very marked radio-necrosis, subsequently developed definite fibrosis, but death ensued 12 months later with metastases in the liver and ascites. In all five cases the growth was situated at the lower end of the rectum.

TABLE II.

Amount of $RaSO_4$.	Duration of dosage.	Reaction.	Result.
100 mg.	18 hours.	Moderate.	Growth smaller. General improvement. Survived 18 months.
100 „	18 „	Very slight.	Marked shrinkage of growth. Died three years later with metastases in liver and ascites.
100 „	18 „	Very severe, sloughing and hæmorrhage.	Growth much smaller, excised six months later. Patient survived three years and died of bronchitis.

Seventeen patients were treated by the insertion of 100 mg. of radium sulphate for 18 hours. In nine of these the growth was at the rectosigmoid junction, and in only one of the nine was the smallest improvement noted. Here there was shrinkage and fibrosis of the growth and improvement of the general condition, but no prolongation of life. In the remaining eight

cases the growth was at the lower end of the rectum. Five of them showed improvement; in two there was slight fibrosis of the growth, but the general condition was improved. In the remaining three local improvement was definite and the general condition much improved (Table II).

In seven cases 50 mg. of radium salt were inserted for 24 hours. Three of these showed improvement, and one in which only a moderate reaction had occurred showed such marked retrogression that the growth was excised three months after irradiation. The patient survived three years and eventually died of heart failure. In two other cases the reaction was moderate, the growth diminished in size, and the general condition improved. The patients survived for 15 and 18 months respectively.

One case of carcinoma of the lower end of the rectum was treated with 50 mg. for 30 hours. A severe reaction, with hæmorrhage and sloughing, resulted; the growth, after showing an initial slight fibrosis, extended rapidly, and the patient died in 10 months.

All cases were histologically verified, the neoplasm being columnar-cell carcinoma. An interesting feature of this set of cases is the variation in the degree of reaction for the same dosages. In some cases definite radio-necrosis resulted and in others the reaction was not appreciable. The supply of radium available at the hospital is being redistributed in smaller containers, and it is hoped in the future to treat such cases by combined surgery and radiation for prolonged periods. Nevertheless, in view of the foregoing cases, it appears to us that when operative measures for the insertion of radium by the open method are inapplicable, the insertion of radium into the lumen of the gut may make the patient's condition more tolerable and under certain circumstances render a previously inoperable case operable. Our best results were obtained from the insertion of 100 mg. for 18 hours and of 50 mg. for 24 hours.

STRANGULATION OF A SLIDING HERNIA.

By HARRY GABB, M.B., B.CHIR. CAMB.,
SURGEON TO THE ROYAL EAST SUSSEX HOSPITAL.

ON NOV. 9th, 1928, late at night, I was called to the Royal East Sussex Hospital, Hastings, to see a man aged 80. He had a very large left-sided scrotal hernia, which was fairly tense and quite irreducible. He had vomited twice and was in pain.

He was anæsthetised and the usual incision was made parallel with Poupart's ligaments; the aponeurosis was divided over the inguinal canal and the obstruction at the external ring divided from above. The sac was opened; it contained colon which was connected to the posterior wall of the sac. Blood-vessels to the bowel came up from the posterior wall. It was obvious that this was a sliding hernia, invested by anterior and posterior layers of peritoneum from the left iliac region. The sac was freed entirely from its connexions, and the incision in it was sutured with catgut. The whole sac and its contents were then pushed back into the abdomen through the inguinal canal, which had been thoroughly opened up. As the patient had taken a great dislike to trusses, which he had probably put on over unreduced bowel, an earnest attempt was made at radical cure. His left testicle and cord were removed and the inguinal canal was entirely closed by deep sutures through conjoined tendon and Gimbernat's ligament; a further row united the external oblique aponeurosis. The patient healed well and at present has no hernia. At his advanced age I considered it worth while to sacrifice his testicle in order to close the canal; recurrence may not occur.

It is sometimes stated that these sliding hernias occur only in elderly men, but I saw three cases in men of military age, at the 73rd General Hospital in France, among the great number of ruptures that arrived there for operation.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

CLINICAL SECTION.

THE meeting of this Section on March 8th was devoted to the exhibition and discussion of

CASES OF ENDOCRINE DISEASE.

The chair was taken by Dr. J. WALTER CARR, the President.

Acromegaly.

The first case, under the care of Dr. C. WORSTER-DROUGHT, was one of Acromegaly. It was demonstrated by Dr. I. M. ALLEN. The patient was a man, aged 33, who reported that during the last six years his face and hands had been gradually increasing in size; also he had occasional headache and diplopia. Two years ago he had an injury to the back of his head, and following that there was paralysis of the left fifth, sixth, and seventh cranial nerves. The head and face, especially the soft parts, were now larger than the average. The size of the tongue had also increased, and there was some separation of the lower teeth. Hands and feet were typically acromegalic, and some kyphosis was noted. In regard to the eyes, the only points to be mentioned were a slight horizontal nystagmus to the right and a weakness of the left external rectus. There was slight facial paralysis of the lower neurone type. Marked changes in the sella turcica were revealed by X rays, the pituitary fossa being much enlarged and the bony margins indistinct. Wassermann was negative and the sugar tolerance normal.

Dystrophia Adiposo-genitalis.

Dr. HUGH STANNUS showed a boy, aged 13, who was the subject of Dystrophia Adiposo-genitalis. The boy was a full-term child, but he was illegitimate, and the history was that the mother had kept herself tightly laced to hide her condition. At two years of age he was ill-nourished and feeble, and learned to walk late. He was backward in speech, and until a year ago his habits were not good. During the last four years he had been somnolent and was readily fatigued. Periodically he drank large quantities of water and ate a good deal of sugar. Micturition was very frequent, and polyuria marked. The boy's weight was now 115 lb. The genitalia gave the appearance of pseudo-hermaphroditism, the very small penis being hidden by folds of fat, these folds resembling labia. There was a general muscular atonicity and it was difficult to elicit the knee-jerks. The mental condition was that of a child of 3, and he was difficult to control. There was no ocular paralysis nor albumin or acetone in the urine. The sella turcica was small and seemed to be surmounted by a cyst.

Dr. PARKES WEBER said that as the cyst seemed to be the most important factor in the case it might be possible, as a method of treatment, to break up the cyst and release its contents.

Sir JAMES DUNDAS-GRANT said that such a cyst had been reached by the sphenoid route.

Myxœdema.—Cretinism.

Sir JAMES DUNDAS-GRANT put forward a case of what he presumed was Myxœdema, in which the manifestations were confined to the palate and larynx. The young woman, aged 19, complained of thickness of the voice, a soft stridor on inspiration and occasional dysphagia, and came before his notice at Brompton Hospital as she was supposed to have tuberculosis of the larynx. There was found to be general thickening of soft palate and uvula and great infiltration of the epiglottis, which almost conceals the rest of the larynx. Wassermann was negative and the sputum contained no tubercle bacilli. A portion of the uvula removed showed no tuberculous or rhinoscleromatous tissue. Great improvement followed the giving of small doses of fresh glandular

thyroid substance, and the patient, after an eight-months' absence, returned to work. An increase in the dose cleared the voice, and there was a generally improved condition.

Dr. PARKES WEBER spoke of cases of localised puffiness, sometimes of actual œdema, of the legs in young women of the same age which had been known occasionally to yield to thyroid treatment.

Dr. H. V. MORLOCK showed a girl, aged 18, the subject of Sporadic Cretinism. The birth was a normal one, and the child walked at the age of 16 months, and was able to talk at 2 years. At 3 it was noted to be getting fat and listless, sat for long periods without playing, and forgot to eat. At 5 years of age her height was 35 in. and there had been no increase by the seventh year. At 7 years of age thyroid treatment was begun, and then development started. Thyroid had been continued ever since. Her height was now 5 ft., and her mental development was fair. In reply to the President, Dr. Morlock said she was now taking grs. 2 of dried thyroid extract daily. Her pulse did not rise now beyond 80, and she was not losing weight.

Dr. E. A. COCKAYNE considered that this case should be called one of juvenile myxœdema.

Pituitary Deficiency.

Drs. E. P. POULTON and E. C. WARNER showed a woman, aged 27, with Deficiency of the Anterior Lobe of the Pituitary. The mother was 5 ft. 3 in. in height, the father somewhat taller. The weight of the child at birth was 5 lb., but she was not backward in sitting up or walking. Mentally she was rather slow, but could read, write, and play the piano. Her first menstruation occurred at her twenty-fourth year, and it usually lasted six days. Sometimes she missed a month. Thyroid swelling was first noted at the age of 6 months, and at 3 years it was so extensive as to demand operation because of pressure symptoms. Indeed four operations had been done for this reason, the last seven years ago. Sections of the gland showed parenchymatous goitre with but little colloid. At present a large swelling in the right lobe of the thyroid displaced the trachea a good deal to the left. Fields of vision were normal, and the pituitary fossa was of the usual size. Some of the epiphyses had not yet joined. The sugar tolerance was normal, and the basal metabolic rate was from 9 to 12 per cent. below the normal. Increasing doses of thyroid and whole pituitary gland had brought about much improvement. The two menstrual periods which occurred since had been normal, she had gained 5 lb. in weight, the thyroid swelling was much less, and the patient had become brighter and happier.

The PRESIDENT raised the question whether, in this case, there was a relationship between the undoubted thyroid disease and a probable diseased condition of the anterior pituitary body.

Dr. G. SLOT, speaking of the methods of giving the remedies, said that at London Hospital Dr. O. Leyton and he tried the effect of giving pituitary extract by the mouth, and by the subcutaneous method in cases which could be controlled by the output of urine. Various oral preparations of the pituitary gland were used, but they had no influence on the urinary output, whereas when the subcutaneous route was employed there was immediate improvement. He did not see any evidence of a pituitary factor in the present case; the thyroid condition probably accounted for all the symptoms.

Dr. PARKES WEBER said he had not heard that pituitary given by the mouth had done any good in cases of pituitary dwarfism.

Dr. COCKAYNE agreed with Dr. Slot that probably in this case the thyroid deficiency accounted for the condition.

Dr. W. S. M. COPEMAN referred to three cases of pituitary deficiency which were studied at Great Ormond-street Children's Hospital by Dr. F. J. Lynton. The latter had concluded that pituitary extract given orally when combined with thyroid extract—though the latter did not seem to be indicated—was a success so long as the administration was being continued.

Dr. WARNER, in reply, referred to the lectures by Harvey Cushing, given three years ago, on endocrine disorders. In certain of the cases there alluded to benefit followed the giving of pituitary, apart from thyroid, and the benefit was sexual as well as general. Following Dr. Gardiner Hill's work, the speaker had tried, in the case of some of these fat people, giving whole pituitary gland alone, also thyroid gland alone; and his general impression was that a larger drop in weight occurred over a given time when the two treatments were combined.

Graves's Disease.

Mr. A. HOBSON (for Mr. Mortimer Woolf) showed a case of Probable Graves's Disease with Thyrotoxicosis. The man, aged 28, first seen four months ago, said his thyroid had been getting large for six weeks. For five weeks his eyes had been very prominent and staring. Both lobes of the thyroid were much enlarged. On admission the pulse-rate was 84 and regular. He did not feel sure that this was Graves's disease. The man was put to bed, and later had a rise of temperature and severe sore-throat. Swabs did not reveal any diphtheria bacilli. Subsequently he lost about 3 lb. weekly in weight, and there was a definite loss of sugar tolerance. The pituitary fossa seemed to be normal. Recently there had occurred a diminution in the thyroid swelling. He was now being treated with glucose and insulin.

Dr. D. E. BEDFORD considered that this patient showed all the usual symptoms of Graves's disease, except that the pulse-rate was 84. Still, a slow pulse did not necessarily mean the case was not Graves's disease; there might be heart-block present. This patient now had auricular fibrillation. If the normal rhythm could be restarted and the general condition improved, he considered that removal of the right lobe was indicated.

Mixed Endocrinopathy.

Dr. I. M. ALLEN showed (for Dr. Worster-Drought) a case of Endocrinopathy of Mixed Origin. The patient was a young woman aged 25, who, when seen, was tired, slow at her work, and of poor appetite. Mental dullness had been increasing for four years. Obesity was first noted about the chest and hips. A year ago she had fits of screaming and noisy hysterical attacks. Menstruation was always irregular. Her frontal and malar bones were prominent; the lower jaw was large and protruded beyond the upper jaw. The hair on the head was profuse and thick, axillary hair was extensive. Pubic hair was normal, but extended to the umbilicus. The cerebro-spinal fluid was normal. Systolic blood pressure was 120, diastolic 75; the sella turcica was not abnormal. Following treatment with extract of whole pituitary and thyroid extract in 3-gr. doses once a day, the weight of the patient was reduced in three weeks from 175 lb. to 164 lb. She became brighter and more sociable, and could carry out small duties satisfactorily. Opinions were asked as to the diagnosis. Conditions other than those of endocrine origin had been carefully considered, such as dementia præcox, post-encephalitic disorder of the pituitary, &c., but no evidence existed to support any other diagnosis. It was regarded as a thyro-pituitary case.

Three Cases of Dyspituitarism.

Dr. WORSTER-DROUGHT and Dr. C. ARCHER exhibited: (1) Dyspituitarism of Mixed Type; (2) Dyspituitarism of Fröhlich Type with Extreme Genital Dystrophy; (3) Dyspituitarism of Mixed Type.

The first of the patients was a boy, aged 15, who was brought to hospital because of his unusual size for his age, his obesity, difficulty in walking, attacks of vomiting, and his mental backwardness. He did not begin to walk until 3 years of age, then he grew rapidly and became obese. He had a large appetite and was very fond of sweets. His height was 6 ft. 1 in., weight (stripped) 19 st. 8 lb. His temperature was always subnormal. The blood pressure was 125

systolic, 75 diastolic. The sella turcica was somewhat small, the frontal sinuses unusually large.

The second patient was a boy of 9, the youngest in a family of six, the other five being normal and in good health. This sixth was a full-term child, and his size seemed normal until 2½ years of age. From that age onwards, obesity had been steadily increasing. The adiposity was general. The temperature was almost always subnormal. The scrotum was completely absent, and no external evidence of testicles could be found. A small penis was present, and was traversed by the urethra. Mentally the boy was somewhat backward, and his habits were dirty. The sella turcica seemed normal; the urine contained neither sugar nor albumin. The blood showed an increase in the large lymphocytes. The blood Wassermann was negative.

The third patient in this series was a girl, aged 10. She was noticed to be getting obese at about 4 years of age, and it had progressed steadily, and during the last four years she had been increasing in stature. She was drowsy, slept a good deal, and said she could go to sleep at any time. The adiposity in her case was mostly round the pelvic and pectoral girdles. The average temperature was subnormal, but the heart was normal. The sella turcica did not appear abnormal.

Obesity.

Dr. TERENCE EAST exhibited a female patient, in the early twenties, the subject of Obesity of Thyroid Origin. The rate of increase in weight had been rapid, she having put on 6 st. in a few months. She had shed her eyebrows, her skin was dry, her feet felt tired, and she was lethargic. There was no change in the thyroid. Her cardiovascular system was normal.

The PRESIDENT considered this to be more like a pituitary case. The patient apparently had very severe headaches while the obesity was developing.

Dr. PARKES WEBER suggested, as an alternative, that it might be premature fibrosis of ovaries.

MEDICAL SOCIETY OF LONDON.

AT a meeting of the Society held on March 11th, Dr. WALTER CARR, the President, in the chair, a discussion on the

CHRONIC DYSPEPSIAS OF CHILDREN OVER THE AGE OF INFANCY

was opened by Dr. REGINALD MILLER. His first intention was, he said, to compare the chronic dyspepsias of children with similar conditions in adults. There was one striking difference between them—namely, the much less important part which was played in the children by the stomach. In the chronic dyspepsia of children local abdominal pain was much less important than in grown people. In the former there was little of the regularly recurring pain, having a definite time relation to meals; indeed, it had a closer relation to actions of the bowels. In children the main symptoms of the condition were those of a constitutional type: lethargy, lassitude, loss of appetite, a coated tongue, foul breath, &c., and particularly general loss of health and alterations in the child's character and behaviour.

Usually the dyspepsias of childhood were divided into the gastric, the hepatic, the intestinal. The gastric were further divided into organic, reflex, and functional. The practical absence of ulcer and growth in childhood brought the organic causes down to small limits. Even chronic gastritis was a comparative rarity in the young, in spite of the frequent use of a faulty diet. Of the reflex kind there was practically only chronic appendicitis to consider. This was debated before the Children's Section of the Royal Society of Medicine, where the general opinion was expressed that though recurrent appendicitis commonly produced recurrent gastric symptoms, yet very little was known of chronic appendicitis producing chronic gastric dyspepsia. He thought that in a general way that verdict would be accepted. Regarding functional gastric dyspepsia in children, much less work had been done in investigating the gastric function in children than in adults, although Dr. W. S. Copeman had recently tried to establish a normal secretory curve, while another worker had come to the conclusion that hyperchlorhydria was a common cause of dyspepsia in children. Symptoms of atonic dyspepsia, of mild grade, were common in debilitated and constipated children, and cases of considerable severity, with a splash and a dropped stomach, were found in weakly children of considerable age. Also there was a very rare type of case, with a dilated and hypertrophied stomach, almost warranting the name gastromegaly. The causation of this condition he did not understand. He did not feel clear about the occurrence of hepatic dyspepsia, though it was true that in chronic indigestion there was often evidence of hepatic derangement. These episodes, however, were probably due to doses of intestinal toxæmia, with secondary disturbance of the liver.

With regard to acidosis and the part it played in association with digestive disorders, it had long been recognised that acid intoxication was associated with periodic gastric symptoms, such as cyclical vomiting, but the latter was not included in the present discussion strictly. But Dr. H. C. Cameron claimed that many cases with chronic symptoms, mostly nervous, but also abdominal, were due to acidosis, though the acidosis on which Dr. Cameron built his theory was not of the type associated with persistent ketonuria; it was a latent acidosis, distinguished by a lowering of the alkalinity of the blood. Dr. A. A. Osman had recently said that 30 per cent. of hospital children suffered from cyclical vomiting. Excluding the consideration of recurrent attacks of cyclical vomiting, there were a large group of cases exhibiting the triad of symptoms: (1) constitutional ill-health, apparently due to chronic toxæmia; (2) nervous disorders probably functional; (3) persistent dyspeptic abdominal symptoms, such as colic, diarrhœa, mucus in the stools, and so forth. He believed Dr. Cameron considered the constitutional factor to be due to latent acidosis, the digestive symptoms being secondary. It was presupposed that the child started with an emotional and neurotic condition. The speaker found it difficult to accept those views, as he did not see how slight latent acidosis could produce persistent and chronic symptoms; moreover, small doses of an alkali would do away with such acidosis. Some children having acidosis were yet well and free from nervous symptoms. His own view was that there was first intestinal indigestion, then toxæmia arising from that; then constitutional ill-health and nervous symptoms arising as a result of the intestinal toxæmia. These views differed in their assignment of the primary source of the trouble, and therefore in the treatment adopted to deal with it.

In intestinal indigestion the symptoms were not always those suggestive at first of a disorder of digestion; in many cases the general constitutional and nervous symptoms overshadowed the abdominal signs and symptoms; these children had an unhealthy looking, muddy complexion, puffy face, dark rings round the eyes, a coated tongue, foul breath, a strong odour from the body, loss of appetite, and were easily fatigued. They might have nocturnal fever, and sweating at night was common; the nerve manifestations took the form of a profound psychological upset. This kind of child was recognised by several signs. There was an enlargement of the abdomen, which might be persistent or intermittent. Flatulence and hiccough were common. There was the occasional or persistent occurrence of abnormal stools, and when the stools were most markedly abnormal it could be seen that there was a deterioration in the child's condition. Another proof of gross indigestion was furnished on microscopical and chemical examination of the fæces, and there was indican in the urine.

Starch indigestion was not a common fault in older children; it could be suspected when

stools were loose and acid and were pitted from the evolution of gas. Signs of secondary colitis might be present. These cases were due to over-feeding with starch. Paraffin indigestion had to be reckoned with; it was due to overdosing with medicinal paraffin. The oil surrounding the particles of food favoured decomposition rather than digestion. Likewise there was a "nut indigestion," in which vegetable cells surrounded by the nut oil were found; he thought some of the new bran preparations produced a similar condition. Pale fatty stools might be simply the result of the undue intake of nut food. With regard to threadworms, apart from the local irritation he knew of no difference in the toxic constipation with threadworms and that without them.

Dr. Miller concluded by discussing the causative factors in intestinal toxæmia. Why was one constipated child in good health, while another similarly constipated was obviously ill from toxæmia? In many cases in children alimentary toxæmia was not associated with intestinal stasis, and very little was seen of cæcal stasis and distension in children. From the examination of 2000 cases he was unable to correlate toxæmia with any quantitative changes in the intestinal flora. The worst cases seemed to be those in which the streptococcal count was high and the coli count low. But who could tell whether those changes were the cause or the result of the intestinal disorder? He considered that colitis was set up not so much by abnormal bacterial poisons as by chemical factors, among them the prolonged use of unsuitable aperients, of irritating foods, and perhaps the passage and pressure of hard fæcal masses. On the colitis much of the toxæmia, he considered, depended. If this were so, it gave an indication of the lines to pursue—giving a smooth residue diet, non-irritating aperients, and colon lavage.

Gastric and Intestinal Symptoms Contrasted.

Dr. W. G. WYLLIE said one of the most striking features of these digestive disorders in young children was the close interplay between the gastro-intestinal and nervous systems. In the dyspepsias mainly intestinal in origin the nervous symptoms so far outclassed those related to the bowel, that it was the nervous manifestations which chiefly coloured the mother's picture of the child's ailment, though they were secondary to the bowel disorder. In the case of gastric disorders—of which vomiting was the chief symptom—probably the reverse was the case. The liver must have an important rôle in all the dyspepsias, but the testing of hepatic functions had not yet reached a stage to be of much use in recognising the effects of intestinal and metabolic toxæmias. To this, however, cyclical vomiting was an exception. Another remarkable feature of the cases under discussion was the abundant manufacture of mucus in the gastro-intestinal tract, in constipated cases as well as those with a tendency to diarrhœa. He divided the chronic dyspepsias of childhood into two groups—those mainly concerned with the intestine, and those in which the gastric functions were most obviously affected. In the first group he placed chronic intestinal dyspepsia, mucous disease, cœliac disease, colitis; in the second group he put bilious attacks, cyclical vomiting, and gastric disorders of definitely nervous origin. Some of these were simply clinical entities; there was no strict definition of them scientifically considered. Chronic intestinal dyspepsia he regarded as especially a disorder of the urban child population of the hospital class, and the chief causes seemed to be external; they had hurried and inadequate meals, and there was a constant nervous irritability. Fainting attacks might occur, also somnambulism. Often there were signs of vasomotor disturbance, such as cyanosed and clammy extremities and enuresis. Sometimes tuberculosis was suspected by the parents. Many cases presented an irritative papular rash in the form of lichen urticatus, chiefly on the trunk and lower extremities. Many of these children had morning retching, due to the collection of mucus in the stomach during the night. Chronic intestinal dyspepsia responded readily to treatment—i.e., a proper adjustment of diet on physiological principles, and continued use of mild laxatives and sodium bicarbonate. Mucous cases also required a proper constitution of the diet, and the improvement of the bowel condition by small doses of hydrarg. cum crete, sod. bicarb., and bismuth salicylate.

Most cases of cœliac disease started towards the end of the second year of life, and it was a very chronic condition. The stools were numerous, pale, bulky, and often frothy; in severe cases there might be streaks of blood in them. These children found it very difficult to assimilate fats and carbohydrates, yet there was no evidence of a pancreatic or hepatic deficiency. Dr. Hutchison had determined the urea production in these cases; it was normal. Two views had been advanced as to the cause of this condition: one favouring a bacterial origin, the other suggesting a purely metabolic disorder. Dr. Wyllie considered that in every case of cœliac disease it would be well to examine the stools for dysentery bacilli, and to have the agglutination reactions of the blood serum investigated. There were strong reasons for suspecting a bacterial agent in cœliac disease, and family cases suggested that the disease could be transmitted from person to person. The question arose whether it was possible that fat was absorbed in cases of cœliac disease and again excreted without being utilised. Bauer had found the blood-fat raised in cases of cœliac disease, quite apart from its cholesterol content. Still, this idea of it being a disorder of fat metabolism must be accepted with reserve, as methods of estimating blood-fats had not been standardised. His own view was that in this disease there was a defective absorption of fats owing to the action of bacteria, probably of the dysentery group.

Bilious attacks were characterised by frequent vomiting for a day or two, often associated with fever and headache. The subjects of it were often decidedly nervous children, and the onset of the attack was often heralded by apathy, irritability, a distaste for food, &c. Usually, there was an underlying state of chronic intestinal dyspepsia. The periodicity of the attacks led to the view that the vomiting was produced by the action of absorbed toxins on the cerebral centres, rather than by gastric catarrh or disability. There seemed to be a close relationship between bilious attacks, cyclical vomiting, and migraine. In cyclical or recurrent vomiting several theories of causation had been put forward, and these the speaker discussed. Certainly the children in whom it occurred were of a nervous temperament.

With regard to dyspepsias in general, McCarrison had stated that they were probably connected, in their origin or in their continuance, with dietetic deficiency and a lack of balance in the food. Mellanby, working on the subject of diarrhœa and vomiting in children, thought that the diarrhœa and vomiting facilitated the entry into the body of toxic substances which were normally present in the intestine.

Discussion.

Dr. B. E. SCHLESINGER said that the ætiology of these conditions was still imperfectly understood. He favoured the view put forward by Dr. Wyllie as to the cases of cyclical vomiting. The speaker had recently seen two cases, in one of which migraine, cyclical vomiting, and attacks of vaso-vagal character, similar to epileptic attacks, occurred. In that child he was able to banish the fits by dietetic measures, by increasing the carbohydrates and decreasing the fats. The explanation of these cases was thought to lie in a temporary anæmia of certain parts of the brain. As a routine, in these cases, he took a record of the blood pressure, and in a certain number of migrainous cases there was a distinct rise in the blood pressure. He did not think all cases of migraine and cyclical vomiting had hyperpiesia. He wondered whether the cases of "nut dyspepsia" mentioned could not be put in the same class as those of quaker oats and coarse wholemeal bread—i.e., foods causing intestinal irritation in children. In colitis there was

not much quantitative alteration of intestinal bacteria found. The speaker wondered whether the production of mucus was not a defensive mechanism of the body. In dysentery, especially late stages of it, an enormous quantity of mucus was passed. It might be a measure of protection against roughage of the intestine by irritating foods.

Dr. F. G. CHANDLER referred to the varying advice sometimes given concerning the same type of case by different children's disease specialists, and asked as to what constituted good breakfasts and teas for children.

Dr. W. S. COPEMAN suggested that the cause of the conditions being discussed was not any diathesis, but that the ground was prepared in early life by various dietetic and therapeutic measures to which the infant had been subjected. Light might be thrown on the matter by studying the effects of diets in children of other countries where other habits prevailed. On the continent a higher carbohydrate diet was favoured for the infant, 10 per cent. being given in milk mixtures in the hospitals. In the adult state the Frenchman was less liable than the Britisher and the American to hyperchlorhydriac dyspepsias.

The PRESIDENT remembered, when many years ago he saw out-patients, the large number of children whom he diagnosed as suffering from muco-membranous catarrh. Measles, he thought, played a very important part in producing chronic dyspepsia in children. The more important respiratory sequelæ of that disease were well known and recognised, but he thought the gastro-intestinal results of that disease were even more numerous than the respiratory.

Mr. ZACHARY COPE commented on surgical causes of chronic dyspepsia, such as chronic appendicitis. Chronic tuberculous glands in the abdomen, either calcifying or non-calcifying, gave rise to attacks of colicky pain simulating that of dyspepsia. X rays would show the calcification, and so help to a diagnosis. If these glands were not diagnosed early and dealt with acute intestinal obstruction might result. Also, chronic intussusception might go on for weeks and be mistaken for chronic dyspepsia of doubtful origin.

Replies.

Dr. MILLER said that those who declared cœliac disease to be an infection should have a clear conception of what the infection was doing. What seemed to point to malabsorption of fat was the fact that long after the symptoms disappeared the fat absorption still remained defective.

Dr. WYLLIE thought the most hopeful research was along chemical lines. The child's breakfast should be somewhat varied from day to day; suitable ingredients were rusks, force, grape-nuts, shredded wheat, a lightly boiled egg, bread-and-butter, bacon, and jelly. More important still was a dose of orange juice before breakfast, both for its relaxing effect and for its contained vitamins.

A HOSPITAL AMALGAMATION.—It has been decided to amalgamate the Devon and Cornwall Ear and Throat Hospital with the South Devon and East Cornwall Hospital at Plymouth. The arrangement is, however, unlikely to become immediately effective, owing to the need for enlarging the accommodation of the larger institution.

DONATIONS AND BEQUESTS.—Mrs. Alice Pigott, of Hove, left £1000 to the Cancer Hospital, Fulham; £300 each to the Royal Hospital for Incurables, Putney, the National Hospital for the Paralysed and Epileptic, and the Solicitor's Benevolent Association; £200 each to Dr. Barnardo's Home for Cripples, Tunbridge Wells, the Church of England Waifs and Strays Society, the Royal United Kingdom Beneficent Association, Charing Cross Hospital, and the Royal Free Hospital.—The Nizam of Hyderabad has given a donation of £1000 to the Ross Institute and Hospital for Tropical Diseases.—Among other bequests the late Mr. J. R. Pope, of Wotton, Gloucester, left £5000 to the Gloucester Royal Infirmary and Eye Institution, and £1000 each to the Bristol Royal Infirmary and the Free Hospital for Children of the Poor at Kingsholm.

Reviews and Notices of Books.

THE PROBLEMS OF APPLIED ENTOMOLOGY.

By ROBERT A. WARDLE, M.Sc., Professor of Zoology, University of Manitoba. Manchester: University Press. 1929. Pp. 587. 30*s*.

THIS work does not aim at being complete in itself but is intended to supplement the volume on Principles of Insect Control, published by Wardle and Buckle in 1923. The first part of the book consists of a review of general problems, and is in fact a consideration of the physiology, œcology, pathology, and toxicology of insects in their relation to insect control. The problems of agricultural entomology are so abundant that it is only natural that they should usurp by far the greater part of the space available. But this makes the book no less stimulating for the medical entomologist, and it is certainly of value to find, set out side by side, such theories as Uvarov's "Phase Theory" of locust migration and the theory outlined by Roubaud and Wesenburg-Lund, of zoöphilous races of anophelines, each involving the idea of biological races characterised by their behaviour. The practical value of the study of insect physiology comes out very clearly in this book, albeit that so far it is mainly such fields as temperature and humidity effects and tropistic reactions which have been exploited. In connexion with "oviposition stimuli," reference might well have been made to the experimental studies of P. A. Buxton and G. H. Hopkins on oviposition by *Aëdes* (*Stegomyia*), for these studies point very clearly the moral of the need for adequate controls and for the statistical examination of results.

The second part of the work represents an attempt to compress into a space admittedly too small a summary of the main entomological problems which exist in all parts of the world at the present day. The arrangement is geographical and the result is a most valuable piece of work. The brief summaries of medical entomological problems are adequate for the most part, though rather less than justice has been done to the work of S. Adler and O. Theodor and others on oriental sore. The mode of transmission of louse-borne relapsing fever was originally demonstrated by C. Nicolle and others in 1913 and not as here stated by Shapsheveka in 1924. Part III. (40 pages of small print) consists of a classified bibliography which purports to be complete for the period under review. The book does not set out to be critical and it contains too many facts to make easy reading, but as a work of reference it will be a essential possession for the agricultural entomologist and the medical entomologist will find it of considerable value.

OLD MASTERPIECES IN SURGERY.

Being a Collection of Thoughts and Observations engendered by a Perusal of some of the Works of our Forebears in Surgery. By ALFRED BROWN, M.D. Omaha, Nebraska (privately printed). 1928. Pp. 264.

FORTY-EIGHT papers are here reprinted from the corner of *Surgery, Gynecology, and Obstetrics* known as the "Surgeons' Library"; they represent a output of one a month over four years. The author modestly disclaims in his preface any pretentions to being a medical historian, but his studies on the incunabula of surgery are on the way to making history; he does not profess to deal exhaustively with his subject, and he has written short essays, mainly round the title pages of the works of our forefathers, from Soranus of Ephesus and Oribasius of Sardis through those of mediæval times, and ending with Cheselden. To try to recreate the personality of surgeons of past generations from a study of their works is, in most instances, the only way. All down the ages surgeons seem to have been as conscious of

each other's deficiencies, to quote the dictum of the late Lord Justice Bowen, as any bench of Her Majesty's judges—vide Ambroise Paré and "mon petit maître" Gourmalen.

How great a part war has played in the evolution of the surgeon is emphasised by the author. As means of killing advanced it became necessary for the surgeon to adapt his methods of treatment to new kinds of wounds. Nothing is said here about the hand-to-hand scuffles of the men of the Stone Age, but we are introduced to the feudal cavalry, heavily armoured both man and horse, suffering mainly from head injuries and fractures due to the lance, mace, and battle-axe; we are told of the arrow wounds resulting from the short bow of Norman times, and we recognise the much more severe wounds resulting from the Edwardian institution of the long bow, where the bowstring was drawn to the lobe of the ear, thus making it a far more potent engine of destruction and, incidentally, making the English archer by far the finest foot soldier of the times. Later on came the crossbow with quarrel, and gunpowder with the harquebusse, musket, and rifle, and finally high explosive. By an oversight, the date of the Black Death, in the essay on John of Arderne, is post-dated 20 years; it should be 1348–49. Praise is due to the author for the skill with which he has marshalled his material; the illustrations of title pages of incunabula and of old surgical instruments are beautifully reproduced and the essays, while certainly not exhaustive, are well written in a pleasant style.

REPORT ON MUSSEL PURIFICATION.

By R. W. DODGSON, M.D., M.R.C.P., M.R.C.S., Director of the Ministry of Agriculture and Fisheries Research Station, Conway. London: H.M. Stationery Office. 1928. Pp. 498. 21*s*.

IN addition to a description of a new method of purification for mussels on a large scale, the report contains a valuable discussion on shell-fish pollution, poisoning from mussels, bacteriological methods of examination, and much information about particular mussel beds. The discussion upon the sources of pollution of mussels and other shell-fish and the evidence as to disease conveyance will be of great interest to those concerned with public health problems. Much obscurity surrounds the question of mussel poisoning, of which an excellent and detailed account is given, valuable material not readily accessible being collected from varied sources. The author divides mussel poisoning cases into three groups. There is, first, the erythematous type which he describes as "musselling," associated with an erythematous rash, often with urticaria and other symptoms, and now usually considered to be of anaphylactic type. The second is the paralytic type, and includes very fatal, but fortunately rare outbreaks of puzzling ætiology. Some eight or ten such outbreaks are described. They used to be ascribed to *mytilotoxine*: the author agrees that this theory is now discredited or at least not proven, but he throws no light on their causation. Dr. Dodgson is somewhat unfortunate in that his volume was written before the only modern report on such an outbreak was issued. We refer to that dealing with the extensive outbreak on the Pacific Coast in the neighbourhood of San Francisco where 102 cases and six deaths occurred. The outbreak was described by Meyer, Sommer, and Schoenholz,[1] and adds much new information as to the cause of the poisoning. The third type is bacterial food poisoning, which rarely follows the consumption of mussels, but cannot be excluded.

A long series of experimental investigations culminating in the elaboration of a simple method of purification of mussels is described by Dr. Dodgson. In its essentials this consists of allowing the shell-fish to purify themselves by short sojourns (two baths each of one night) in tanks of sterile sea-water with a third treatment with chlorinated water to kill any bacteria on the shells. The mussels are then packed in sterilised bags ready for the market. The utility of this method is demonstrated by numerous bacteriological investigations, nearly complete sterility being attained. The economic side of the process is discussed and it is shown to be a practicable procedure from the economic aspect. Very many other problems are dealt with in the report, such as the life-history of the mussel and its habits, bacteriological examination, bacteriological standards, and the like. The general bacteriologist will find much to interest him in these sections of the report. Many points discussed are highly technical; for example, the author finds that lactose-containing culture media are unreliable for primary shell-fish examinations, the reason being that glucose is produced from mollusc glycogen by enzyme action. The vexed question of bacterial standards for shell-fish is discussed in detail; such standards are regarded merely as indications that contamination is liable to occur.

The whole report is a useful piece of work reflecting great credit on the author.

[1] Journal of Preventive Medicine, 1928, ii., 365.

TRIAL OF J. B. RUSH.

Notable British Trials Series. Edited by W. TEIGNMOUTH SHORE. London and Edinburgh: William Hodge and Sons. 1929. Pp. 272. 10*s*. 6*d*.

RUSH, the Norwich murderer, killed his landlord, Isaac Jermy (recorder of Norwich) and his landlord's son one night in 1849. He owed Jermy a large sum, had no money, and had soon to pay off a mortgage on his farm. Having forged documents which might help him financially if Jermy's death occurred forthwith, he went up to Stanfield Hall partially disguised and shot the inmates. With four bullets he murdered the father and son and wounded Mrs. Jermy and a servant. Cunning enough to lay a false trail of suspicion, he was too stupid to see that the attempt to cover his tracks merely made his conviction more sure. This adequately edited volume has less medico-legal interest than many of the series to which it belongs. Rush, defending himself unaided and haranguing the jury vigorously, makes a notable figure. After his wife's death he had engaged for his children a governess whom he seduced under promise of marriage. The poor woman, truculently cross-examined by the accused, gave evidence of his movements and conduct which went far to establish his guilt. Had he kept his promise and married her, that evidence could not have been given and he might have saved his neck.

THE MACHINE OF LIFE.

By ETHEL BROWNING, M.D. London: William Heinemann (Medical Books), Ltd. 1928. Pp. viii. +124. 5*s*.

THIS latest addition to the increasing number of books presenting physiology and anatomy from the popular point of view has much to recommend it. The author has not only covered the traditional grounds of describing the anatomy and physiology of the various systems, but she has included an excellent chapter on reproduction and one on the mind as distinct from the nervous system. On the whole the subject matter is presented clearly and accurately but in places revision is necessary. The arrangement of headings throughout could be improved. The last half a dozen lines on the ear (p. 41) do not make sense, while the heart is described under the heading of "The Lymphatic System." The description of the heart as "placed obliquely," and later on as "divided horizontally" and "divided vertically" makes very confusing reading (pp. 63, 64). The book gives the impression of having been put together too hastily, but the author certainly has that ability to describe technical details in simple language which is the essential quality in the production of a book of this kind.

TEXT-BOOK OF PATHOLOGY.

Second edition. By ROBERT MUIR, M.A., M.D., Sc.D., LL.D., F.R.S., Professor of Pathology, University of Glasgow; Pathologist to the Western Infirmary, Glasgow. London: Edward Arnold and Co. 1929. Pp. 872. 35*s*.

THE primary object of this book was to provide for medical students a text-book dealing on the one hand with the scientific aspect of general pathological processes, and on the other with the systemic pathological changes of special importance in relation to clinical medicine and surgery. In the preparation of the second edition Prof. Muir has wisely kept this object in mind and has not altered the general plan of his book. This edition is larger by a hundred pages than the first, and contains about seventy additional illustrations, but this enlargement is the result of the judicious incorporation of new matter and the careful revision and expansion of the text.

When it first appeared Prof. Muir's book was recognised as the most important publication of its kind in this country. Its popularity has continued to grow, for it has the peculiar merit that the more it is consulted the more its excellence becomes apparent. In no other book of its size with which we are acquainted is the lucid presentation of general principles combined with such a wealth of detailed information. The care with which the second edition has been prepared can only be appreciated by a close study of the text; but such an examination will show that almost every page has been passed under review. The result is not only an admirable text-book but a work of reference which should be in every pathologist's library.

PRACTICAL BIOCHEMISTRY FOR STUDENTS.

By E. W. H. CRUICKSHANK, M.D. Aberd., D.Sc. Lond., Ph.D. Camb., M.R.C.P. Lond., Professor of Physiology, Prince of Wales Medical College, Patna. Calcutta: Butterworth and Co., Ltd. 1928. Pp. 275. 12*s*. 6*d*.

THIS work appears to be exceptional in that the author has broken away from the standard of somewhat depressing experiments which usually form the subject matter of text-books of practical biochemistry and chemical physiology. The first few chapters are devoted to a brief description of laboratory equipment, standard solutions, and so forth, together with some general directions to the student. Then follow three chapters which give fairly detailed accounts of proteins, carbohydrates, and fats in turn, details of tests for the substances coming under these headings being given. The digestive processes are next dealt with fully, a short chapter being included on bile. Chapters VIII. and IX. deal with the urine; full accounts of qualitative and quantitative examinations are given, and in many cases alternative methods are described. Chapter X.—a short one on the chemistry of foodstuffs—has been completely omitted from the table of contents, upsetting the numbering of the subsequent chapters in the text. The last 50 pages of Part I. deal adequately with the blood and its chemical analysis. Of special interest is the chapter on the neutrality mechanism of the blood in Part II. This is very well written and goes into some of the more difficult and complicated aspects of the subject. It commences with a detailed description of the colorimetric method for estimation of pH of the blood, followed by a brief but clear account of theoretical considerations. The author, we think, has handled the mathematical aspects of the subject very cleverly indeed, and he has written an account which should be easily understood even by one who finds mathematics difficult. The difficult subject of buffers is also tackled from a modern standpoint. A short series of references to this part of the book is given, and the appendix includes some useful tables.

The volume is small and well arranged, and gives a concise account of the subject matter with refreshing originality.

CLINICAL RADIO-DIAGNOSIS OF THE INTESTINAL CANAL.

By H. CHAOUL. Berlin: Julius Springer. 1928. With 893 illustrations. Pp. 642. M.48.

MANY books have come to us from Germany in the last few years, but this volume is outstanding and is likely to become a classic in the literature of the gastro-intestinal canal. The illustrations show a very high order of radiographic technique and are very well reproduced. The technique of the author differs slightly from that in general use, but seems to be effective both from the radiographic and screening point of view. The manner in which he uses looking-glass observations for screening and radiographing the duodenum is simple and, judging by the radiographic results, efficient.

That such a splendid book should be put up in paper covers and published with uncut pages is a curious example of misplaced economy. We were so impressed, after a brief survey, with the value of the contents, that the rebinding of the volume in a manner more worthy of the enormous labour and high achievement of the author seemed imperative. The publishers have used art paper throughout, and the radiograms have been extremely well reproduced. After rebinding it is now a first-rate volume in every way, the letterpress being clear, not redundant, and well arranged.

MALAY POISONS AND CHARM CURES.

Third edition. By JOHN D. GIMLETTE, M.R.C.S., L.R.C.P. London: J. and A. Churchill. 1929. Pp. 301. 10*s*. 6*d*.

THE first edition of this book was published in 1915 and was quickly sold out of print. It took rank as an authoritative pronouncement on forensic medicine in the local law-courts, and a second edition was produced in 1923. The third edition has been brought up to date, but much research still remains to be done in working out the physiology and toxicology of some of the poisonous plants which abound in Malay. The Borgias and other celebrated poisoners of the past would have revelled in the possession of such a collection of obscure poisons. The book is divided into two parts, the second of which is devoted to the poisons obtained by Malays from fish and other members of the animal kingdom, from jungle plants and other vegetables, and those derived from inorganic sources, such as arsenic, mercury, cyanide of potash, pounded glass, sand, and quicklime. This part of the book is of real scientific value. An appendix gives examples of spells and charms transcribed into Romanised Malay, a classification in natural orders of the poisonous plants, and a list of Kelantan poisons.

The first section of the book forms a treatise on Malay folklore and is extremely interesting. It is entertaining to note that the ideas on magic and witchcraft current in Malay are similar to many which can be found in the folklore of the Occident. Bile is much prized by Malayans as a medicine. Roger of Hoveden, informs us that, in 1191, King Richard I. ordered most of those captured at the siege of Acre to be put to death.

"5000 were slain and disembowelled by the Christians who found much gold and silver in their entrails, while they preserved their gall for medicine."

Jin and other spirits, according to Malay legends precede man in creation:—

"The Creator determined to make man, and for that purpose He took some clay from the earth and fashioned it into the figure of a man. Then He took the spirit of life to endow this body with vitality and placed the spirit on the head of the figure. But the spirit was strong, and the body being only clay, could not hold it and was reft in pieces and scattered in the air. These fragments of the first great Failure are the spirits of earth and of sea and of air. The Creator then formed another clay figure but into this one he wrought some iron, so that when it received the vital spark it withstood the strain and became man."

Veritably these were men of blood and iron.

THE LANCET.

LONDON: SATURDAY, MARCH 16, 1929.

NUTRITION IN THE COALFIELDS.

THE impression produced by the latest official Report [1] on conditions in the coalfields will depend very much upon the mind and temperament of the reader. Those seeking reassurance will read with easy conviction that there is no increase in the epidemic death-rate, the death-rate from tuberculosis, or the infantile death-rate, and will reflect that any serious state of malnutrition must early show itself in an increase in some or all of these. Others may be less easily satisfied and may be led to wonder whether the latent period between malnutrition and the ultimate detriment to life may not be a long—even a very long—one, though the effect may be none the less inevitable. Conditions of malnutrition, either qualitative or quantitative, have to be very severe before they imminently endanger life, particularly where the health services are still in operation. Thus, to take as an extreme case of qualitative malnutrition the 150 cases of hunger-osteomalacia ("adult rickets") studied as out-patients by HUME and NIRENSTEIN [2] in Vienna during the food-shortage of 1920, none was ever known to be lost from the series by death, and as far as any evidence was to be found in the vital statistics that batch of terribly suffering humanity might never have existed.

"Rickets does not kill," it has always been said, and rickets is the only definite disease of qualitative malnutrition which seems likely to be a serious menace in the distressed areas. In this latest Report we are told that it is present in increased degree in certain of the regions investigated. It is not stated how the diagnosis was made, but presumably it was a clinical one based on visible or palpable deformities, and it must be borne in mind that such a diagnosis is bound to overlook many less severe cases in which the calcium balance is actually negative and the disease would be clearly shown by radiographic examination. Though we may say that "rickets does not kill," we should be extremely loth to say that any child which has had rickets will afterwards be exactly the same as if it had not had rickets—apart from the needless suffering and economic waste. The Report states that the welfare centres are dealing with the disease as soon as it appears among those who attend, but it is much to be desired that some special effort should be made to reach all children with a reliable cod-liver oil and all mothers with instruction on the importance of exposing their children to every bit of available sunshine, and so to make good as far as possible, by other than dietetic means, this qualitative deficiency in the food, if such a deficiency must continue. It is not stated whether the children affected are breast-fed babies; it is only said that they are "children in the early years of life"; so it cannot be deduced how much the child's disease may be due to the mother's nutritional failure. But the Report does go on to say that the prevailing diet is "unsuitable for the maintenance of health over any prolonged period, and especially for young children and nursing mothers." The whole account induces a profound misgiving that the supply of vitamin D, even to the adult population, may be insufficient. In view of these latest revelations, greater stress should perhaps be laid upon this particular need than was done in our columns a few weeks ago.[3] The margarine used should be exclusively one to which the vitamins A and D have been added, and fat fish should be particularly commended. Skimmed milk will supply calcium and other salts, and is a great deal better than no milk at all. It is, however, extremely hard to find cheap articles of diet which will supply vitamin D. Adults, besides children, should make use of the sunshine when it comes, and cod-liver oil should be available for mothers as well as children.

When we turn to the question of quantitative insufficiency, the Report expresses doubt also about the caloric value of the diet. Without accurate measurements of food consumed and of the height and weight of the affected population, this must be a difficult matter to decide, and where so many psychological factors exist to promote depression, the outlook of the people cannot be taken as any index of their degree of under-nutrition. It is probably outside the scope of this Report to make recommendations concerning the machinery by which the adequate qualitative and quantitative nutrition of these poor people should be secured and the Commissioners pass on to deal with political considerations where medical comment would not be relevant.

[1] Report on Investigation in the Coalfields of South Wales and Monmouth. London: H.M. Stationery Office. 1929. Pp. 10. 3*d*.

[2] E. M. Hume and E. Nirenstein: THE LANCET, 1921, ii., 849.

CONGENITAL DISLOCATION OF THE HIP.

CONGENITAL dislocation of the hip is relatively rare in this country. LE DAMANY estimates that there are at least 200,000 cases living in France, and in Brittany the proportion of cases to the general population is still higher. In the north of Italy also the lesion is very common; at least 1000 patients are treated annually at Milan and Bologna. We lack statistics as to its prevalence in countries other than those mentioned. In London, which probably draws cases from a population of at least ten millions, probably not more than one hundred new cases are seen annually. We cannot tell why there should be this remarkable contrast in liability to this dislocation between the inhabitants of different European countries, or why the Celtic Breton and the Lombard Italian should share the same unfortunate prominence. The sex incidence of the defect is also unexplained, for no satisfactory theory has been formulated to account for the fact that 85 per cent. of cases are found in female infants.

It is now generally accepted that the deformity is due to a developmental defect of the pelvis, which may give rise to subluxation or even luxation before birth, or may produce deformity only in postnatal life. The nature of this defect and of the progressive secondary changes which occur when the femur remains displaced form the subject of the greater part of Mr. H. A. T. FAIRBANK'S Lady Jones lecture delivered recently in the University of Liverpool. Its concluding paragraphs deal with problems of treatment by means of open reduction considered in the light of research into the anatomy of the joint. Mr. FAIRBANK bases his observations on a study not only of museum specimens and radiograms but upon facts noted during exposure of the parts in the course of operations, upon the "pathology of the living," as the

[3] THE LANCET, Jan. 5th, p. 28.

President of the Royal College of Surgeons of England has happily called this method of study of morbid anatomy. As Mr. FAIRBANK points out, the primary fault in all cases appears to be the poor development of the upper margin of the acetabulum, a defect which hinders normal function even after successful reposition of the head of the femur. Only very slowly can the defect be made good, if indeed it can ever be completely corrected. All other changes are of secondary import. That the malformation involves not only the cotyloid ligament, but also the cartilaginous margin and the bone even when dislocation is not yet complete, is clearly shown in two fœtuses described by LOCKWOOD. After birth, and when the femur has been used, usually some sort of false acetabulum is formed which is shallow and incapable of retaining the head of the bone in position. In time this false socket may show arthritic changes, to which may be due much of the pain to which adults suffering from unreduced dislocations are liable. Mr. FAIRBANK draws especial attention to the condition of the ischium, which, he thinks, has hitherto not received the attention it deserves. This bone shows more changes than any other part of the pelvis except the acetabulum itself, of which it forms part. It often displays facets and ridges; the facets may have articulated (if such a term is applicable) with a facet on the lesser trochanter of the femur, while the ridges are probably due to the attachment of a much hypertrophied ischio-capsular ligament which, as will be seen later, plays an important part in the partial stabilisation of the luxated femur. The altered joint cavity overlaps the front part of this surface. The attachments of the distended and, in most cases, thickened capsule are very different from those of a normal joint, especially as regards their extent on the pelvis. The changes in the femur and those of the acetabulum are due partly to loss of the normal reaction and stimulus to growth furnished by pressure and friction between the two; in the femur the ossific centre in the head is late in making its appearance, and when visible in a radiogram it is smaller than that of the normal head. Abnormal pressure against the pelvis distorts its external form so that it is commonly wedge-shaped, and sometimes conical. As to the neck, Mr. FAIRBANK records the appearance of coxa vara in only nine out of 32 cases. One would hardly expect marked coxa vara when the bone is not exposed to superincumbent weight upon its head. Antetorsion of the neck has been much talked of, and has been regarded as one cause of relapse, but Mr. FAIRBANK has not found it often or in great degree.

How the weight of the body is transmitted from the pelvis to the femur in an ambulant case of dislocation of the hip has been much discussed. In the absence of the fulcrum or pivot of the normal pelvi-femoral articulation, there are only muscles and ligaments to prevent the upper end of the femur ascending to an indefinite extent. Yet although there may be a certain amount of so-called "telescopic" movement, it early becomes limited and ceases to increase. Mr. FAIRBANK shows that practically all the muscles attached to the upper end of the femur take part in the task of fixing and steadying it, while they are powerfully aided by some parts of the capsule, and particularly by the ischio-capsular band, already referred to, which forms a sling across the neck of the femur, whereon it often leaves marks of its pressure. Ascent of the upper end of the thigh-bone must obviously reduce the length of the limb as measured from the pelvis, but it is a curious fact that the limb itself, measured from the great trochanter, may be longer than its normal fellow. Mr. FAIRBANK refers to a case where, ten years after reduction of a congenital dislocation, the affected limb was three-quarters of an inch longer than the sound one; but in many cases the femur is shorter than normal. The changes in the capsule are well known. The hour-glass contraction and the thickening have been observed by surgeons in many open operations, and the contraction has been long recognised as one of the obstacles against securing a stable reduction by means of manipulation. It may be so great that, with the aid of adhesions, it serves actually to divide the cavity of the capsule into two compartments. The tendon of the ilio-psoas muscle, which in most cases bends sharply outwards and backwards just below the anterior inferior spine of the ilium, often accentuates the hour-glass contraction and forms such an obstacle to reduction as to require division. But a distinct isthmus in the capsule has not been seen by Mr. FAIRBANK more than once in patients under the age of 3 years. He describes certain folds of synovial membrane which are of importance in considering difficulties of reposition. One of these is situated vertically at the back of the acetabulum, and another more or less horizontally at the level of the upper acetabular margin. This fold hinders reposition of the head; it disappears when weight is put upon the limb, but when the head is pushed down in attempts at reduction it becomes folded into a ridge below. The cavity of the joint, as described by Mr. FAIRBANK, consists of three portions, one corresponding to the old acetabulum, another over the anterior and upper part of the retro-acetabular bone, and separated from the first by a vertical fold, and a third, still higher, corresponding to and enclosing the displaced head of the femur. All the pelvi-femoral muscles are adversely affected by the dislocation. The direction of their tendons is altered and their points of insertion have an abnormal mobility when the acetabular fulcrum is absent. Some of them find their origins from the bone reduced in area. Mr. FAIRBANK discusses each muscle at some length, and shows how the three levers on which the muscles act are lengthened or shortened by the displacement of the femoral head. It seems clear that in the absence of the fixed centre of angular movement in the acetabulum nearly all the muscles concerned must be contracting in the act of walking, in order as much as possible to fix the head. During this process there must be a good deal of waste in the form of "lost motion" or "back lash," as the mechanics call it. Pain in the young is probably due to muscular fatigue from this overaction, though in the old it is often attributable to arthritis.

On the question of treatment Mr. FAIRBANK is judiciously conservative. He deprecates the tendency of surgeons in America, and in a less degree here, to resort to open operation with increased frequency. Manipulative reduction gives the best results in young children, and if it is done before the age of 3 years, or better still before the age of 2, a permanent cure may be anticipated in a very large percentage of cases. When considering open reduction, the surgeon must remember that many patients lead tolerable lives with unreduced hips. The deformity is not dangerous to life and does not justify desperate measures. As to relapses, these are often due to want of outgrowth of the upper margin or shelf of the acetabulum, for which condition open operation and bone grafting is advisable. Open operation is also useful in patients of reasonable age whose hips are irreducible by manipulation. Attempts at reduction

after the age of 9 for a unilateral and 6 for a bilateral case are of very doubtful value. For old arthritic cases arthrodesis in an artificial acetabulum is likely to give the best result. In bilateral cases, of course, only one hip must be thus fixed.

NOISE AND ANNOYANCE.

A LARGE proportion of the ills which afflict the community result, directly or indirectly, from the development of a mechanical civilisation. Congestion in large towns has led to lack of accessory nutritional factors, exercise, sunlight, and fresh air; the use of mechanical transport has been the cause of hurry, anxiety, and to a certain extent of stagnation. It is only recently, however, that any public attention has been directed to noise as a social evil. We have grown up without noticing its gradual increase, but anyone who pauses to listen to the hubbub of a London street at midday will realise how noisy civilisation has become. Lorries crash and rattle; motor-cars constantly sound electrical alarms; motor-cycles bark; hawkers cry; trains thunder beneath and aeroplanes roar above; and the road-mender's pneumatic chisel and its brother the steel-worker's rivetter complete the pandemonium.

It is probable that most city dwellers find noise an intermittent nuisance, but several high authorities have now declared that it is a definite menace to the public health, resulting in loss of efficiency and energy. The British Medical Association at its last annual meeting passed a resolution in favour of legislation empowering local authorities to suppress unnecessary din, and submitted to the Minister of Health a long memorandum on the effect of noise. The Minister also received at the end of last year a deputation, including several eminent mental specialists, neurologists, and physicians, from the People's League of Health, requesting him to promote legislation to reduce noise. Dr. Dan McKenzie, in his third Chadwick lecture, delivered on Feb. 21st, dealt with the same subject and suggested administrative remedies The effect of noise is considered on the healthy citizen, the ailing citizen, and the industrial worker. The general effect on the nervous system was summed up by Prof. G. Robertson in his speech to the Minister, and his view is supported by other specialists. "The first effect," he said, "is one of disturbance, of excitation, and of irritation. . . . It is impossible to measure these mental states with scientific accuracy or to weigh them exactly, but that they exist no one doubts. They have consequences of many kinds on conduct. They cause loss of temper, they play a part in quarrels, and they prevent deep and sustained thinking." Noise, he continued, might prevent a person from going to sleep, might break and interrupt his sleep, might make his sleep disturbed and unrefreshing, or might produce insomnia. Dr. Matthew Ray dwelt on its bad effect on the mentality of children, and Mr. E. B. Turner, speaking as a general practitioner of long experience, said that he had watched the effect of the irruption of a constant stream of noisy traffic into a previously quiet residential district; the inhabitants, who before had been healthy, developed numerous disorders. Sir Maurice Craig said that he had been impressed for many years by the increasing number of persons whose health had suffered from noises in the streets of London. Dr. Ray also pointed out the extent to which street noises delayed the recovery of hospital patients. Speaking of industrial noise, Sir Thomas Oliver contended that it caused structural changes in the organ of hearing and functional derangement of the nervous system. Holders-up and rivetters nearly all had their hearing affected in a few years, and suffered from impaired health.

Various remedies have been suggested for this evil. The deputation recommended that noise should be placed among the nuisances with which a sanitary authority is empowered to deal under Sections 91–112 of the Public Health Act, 1875. It probably also had in mind the possibility of legislation empowering the Ministers of Health and Transport to frame ad hoc regulations for the suppression of particular noises. Mr. Turner suggested the enforcement of zones of silence round hospitals; the placing of white lines across the openings of side roads into main roads to obviate hooting; limitation of weight and bulk of goods carried by road, and the speed and hours of work of lorries; pneumatic tyres on all lorries; the prohibition of sale of motor-cycles without effective silencers, and strict enforcement of the law on silencers; and the by-passing of as many country towns as possible. Dr. Dan McKenzie suggested that zones of silence during hours of silence should be enforced by the police; that streets in front of schools, colleges, hospitals, and nursing homes should be rubber-paved; that the size, weight, and speed of motor-lorries should be reduced, and that heavy goods should all go by rail. The British Medical Association, in addition to the nuisances mentioned, included the cries of street-vendors, the barking of dogs, and the careless handling of milk cans. They suggested that pneumatic drills should be forbidden altogether in proximity to occupied dwelling-houses at night, and that some educative campaign should be started to reform those who "race" their engines while shouting noisy good-byes after parties in the small hours.

Unfortunately, the remedy is not clear. The Minister of Health expressed serious doubt whether any clause concerning noise could be introduced into the Public Health Act as it stood, but manifested a desire for more scientific data; and this would probably be the attitude of the legislature towards any ad hoc measure. Many citizens might well hesitate to add to the already formidable extra-legal powers possessed by Government departments without overwhelming necessity. Again, as the Minister observed, many authorities doubt whether noise in industry interferes with the health of the workers to the extent suggested, and Dr. McKenzie, at the close of his lecture, admitted that a large proportion of the noises which troubled hospital patients originated inside the hospital. These public pronouncements have undoubtedly expressed a need, but that need will best be served in the immediate future by the patient accumulation of trustworthy evidence upon which legislative reforms would follow. The views expressed by the medical authorities who took part in the deputation to the Minister of Health were perhaps more emphatic than scientific; the effect of noise in producing nervous illness among factory workers, for example, should be capable of more exact proof than has been provided. One direction for exact investigation was indicated in our own columns last week by Prof. Swale Vincent and Mr. J. H. Thompson who showed the effect of agreeable sounds upon blood pressure in the human subject. Disagreeable sounds may well have a pressor effort which could be determined. Mr. Neville Chamberlain, in his reply, pointed out that he did not recognise in his own case the alarming effects depicted by one of the deputation, and there are certainly many who, like him, are unaffected by noises that may be

intolerable torture to less fortunate or more nervous people. Yet the fact that large numbers of people, whether nervous or not, undoubtedly suffer intensely from noise is sufficient for all reasonable persons to support measures to diminish this nuisance. Meanwhile, however, there exists another and perhaps a more effective approach to the problem. So much of the harm is done by individual thoughtlessness—the noisy theatre-party, the loose tailboard, the unnecessary klaxon, for example—that it seems reasonable to hope that real reform could be brought about by the same methods which have caused a marked reduction in the amount of litter and vandalism in our parks and public places.

Annotations.

"Ne quid nimis."

LOCAL GOVERNMENT BILL.

OUR readers will have followed in the daily press, and at greater length in our own columns, the proceedings in the House of Lords while this important measure has been under debate. Last week Lord Onslow offered to introduce a clause impressing upon local authorities the desirability of their fullest coöperation with the voluntary hospitals, the offer being in reply to Lord Reading's criticism of the lack in the Bill of such provision. As a result a clause was agreed which was so far satisfactory that Lord Dawson withdrew his intended amendment, the first part of which was thereby met, relying on Lord Onslow's offer to amend the new clause on the Report stage of the Bill so as to ensure consultation between the public assistance committees and representatives of the local medical practitioners of the area. The feeling of the medical profession will certainly be in favour of any plan which will bring private practitioners, individual or consultant, into working coöperation with the public health services, and it is difficult to see upon what grounds so important a provision can be refused, or why anything but general profit should be expected from it. An account of the debate will be found on page 571 of this issue of THE LANCET.

INJURIES IN WORKSHOPS.

THE war and the decade succeeding it has seen many far-reaching changes in the practice and conduct of industry. Not least important of these is the greater attention paid to the human factor, and among other aspects of industrial welfare work the prevention and treatment of accidents is one that has naturally received a good deal of consideration. This particular problem was brought into much prominence during the war, when the speeding up of production was partly responsible for an increased number of industrial accidents. By the Police, Factories, &c. (Miscellaneous Provisions) Act, 1916, the Home Secretary was empowered to make statutory orders regarding the provision of first aid and ambulance arrangements in factories. In 1919, by which time the obligatory provision of these orders had been applied to a comparatively small number of industrial processes, the Home Office issued a small pamphlet, for the guidance of employers and others, on the general principles of first-aid and ambulance arrangements. Sections on first-aid boxes and their use, ambulance rooms and their equipment, the removal of injured persons and the organisation and training of first-aid personnel were followed by appendices and plates; the whole forming a concise and useful guide to the subject from the point of view of those to whom it was addressed. In 1923 the mass of statutory orders had reached the stage where simplification was desirable, and by the Workmen's Compensation Act of that year (which was not repealed in respect of first-aid matters by the Workmen's Compensation Act, 1925) the whole of British industry was brought into line, and the universal provision of first-aid arrangements was made obligatory in all factories. Voluntary societies and the private efforts of individual firms have done much to forward the work of caring for the injured at work, so that to-day most industrial plants are fitted to deal adequately with all those minor accidents which have so unhappy a knack of having unfortunate sequelæ as a result of sepsis or neglect. Official action during this time has been consistently helpful, and the changes brought about by the 1923 Act were effected without friction largely owing to the conciliatory and helpful advice given in all cases by the Home Office. After ten years of progress and change the Home Office pamphlet which proved so useful at its first appearance has passed to a second edition,[1] and while it retains all its former virtues some of these have become somewhat dulled by the passage of time. Change for the sake of change is undesirable, but the complete re-drafting of such a publication as the one under review tends to maintain interest, whereas its mere reprinting with a few minor additions and complete with the original war-time photographs may induce a sense of stagnation rather than progress. The 1919 edition urged the necessity for a more extended course of first-aid training for welfare workers, and suggested that the courses might have to be revised in the light of this need. The paragraph is reprinted in the new edition, but no indication is given of what has been done during the preceding decade to supply a need which, owing to the extended scope of the work called for by the Workmen's Compensation Act, 1923, has become vastly more important than it was ten years ago. The rest of the booklet is accurate, concise, and helpful to the layman confronted with the task of complying with the regulations or making a voluntary effort to provide facilities in excess of those required by law; but anyone who compared the two editions might be pardoned for wondering whether any official notice had been taken of the mass of voluntary effort made by progressive firms in the past few years, while an inquirer making his debut in this field might well ask whether the photographs really represent the last word in design. If he deduced from this that the rest of the book was a little out of date, he would be wrong; but attention to details of this kind sometimes makes the difference between interest and apathy.

PARASITIC PROBLEMS IN THE LESSER ANTILLES.

THE oldest of Britain's surviving colonies and once the most highly prized of all, the Sugar or Caribbee Islands, now have sunk into comparative oblivion. Many factors have been responsible for this: the opening up of the new and larger lands elsewhere, the abolition of cheap slave labour, the fall in the price of sugar, the lessening demand for the long-stranded sea-island cotton used in lace-making, are some of the more obvious. Yet although they are now not much in the public eye unless some devastating hurricane or some volcanic outburst brings them forcibly into the daily papers, they present important problems to the hygienist. Some of these—more particularly those caused by the animal parasites—were considered by Dr. T. W. M. Cameron in a paper read last week before the Tropical Diseases Section of the Royal Society of Medicine. The most widespread and serious problem is malaria, which is common on most of the islands. Barbados, once free from this disease, was the seat of a serious epidemic in 1927, which has not yet been brought under control; and the only islands now free from the parasite appear to be Montserrat and St. Kitts.

[1] First Aid and Ambulance for Factories and Workshops Welfare. Pamphlet No. 4. 2nd edition. Home Office. H.M. Stationery Office. 1929. 4*d*.

Filariasis, another mosquito-borne disease, is still rampant in many of the islands, although in general its importance seems to be steadily declining. "Barbados leg," as elephantiasis once was called, is now comparatively rare in that island, and even in St. Kitts and Antigua, which once were strongholds of the disease, there has been a very considerable decrease in its incidence during the past 20 years. The majority of the important diseases, however, are fæces-borne; enteric and dysentery, diarrhœa both in infants and children, and helminthiasis are the commonest of these. Enteric and dysentery are not so universal as they used to be, but helminthic parasites are still very common. Hookworms are found in all the islands but are especially common in the southern groups. In Barbados, with two kinds of soil—clay and chalk—they are widespread on the first and rare on the second; in Antigua where chalk, clay, and volcanic soils are found, there is a light infection on the chalk, medium on the clay, and heavy on the volcanic portions. In all districts soil pollution is universal and heavy, and light infestations are due to natural causes, not to man's activities. The round worm, *Ascaris lumbricoides*, is even more common and about 60 per cent. of the inhabitants are infected. These two parasites cause a great amount of debility and are very important economic factors in the prosperity of the islands.

Schistosomiasis has not the same general spread as the truly intestinal parasites, and is confined to St. Kitts, Antigua, and St. Lucia among the British islands. The parasite found in these islands and throughout the tropical parts of the New World is *Schistosoma mansoni*. It was first reported by Sir Patrick Manson from Antigua in 1902, but there is reason to suppose that the patient acquired his infection in St. Kitts. The parasite, like all the others, originally came from Africa, probably with the negro. In St. Kitts, however, for over a hundred years African monkeys have roamed the forests and plagued the planters; Dr. Cameron found that in addition to being an economic nuisance, they were also harbouring *Schistosoma mansoni* and were consequently likely to prove a serious factor in any schemes for the eradication of the disease. Therapeutic measures, which have been successfully used against this parasite in man, could in theory eradicate it if all human carriers were treated and cured and if no reservoir existed to reinfect the snails. But a wild monkey cannot be treated and so eradication must necessarily, in St. Kitts at least, lie in attacks on the immediate hosts which live in considerable numbers in the few streams in the island. Among the minor horrors of the West Indies are insect pests of all sorts; the domestic flies, particularly evident on Sundays when the shops are closed; mosquitoes, which bite in relays throughout the 24 hours; chigger fleas, which burrow into the skin of the toes; Jack Spaniards, large wasps which can sting most ferociously; bêtes rouges, harvest mites which climb up the grass on to the limbs and where the clothing fits tightly, enter the skin—these and many others plague the life of the stranger. In a few islands poisonous snakes still exist, while in Trinidad there lives a species of blood-sucking bat which, while it does little permanent damage, is a considerable source of annoyance to man and beast alike. The major problems of these islands, however, can be solved only by drainage and fæces disposal schemes—and above all by education. The negro has still to acquire the latrine habit; when he has done this the high degree of parasitism will be enormously reduced. Venereal disease, another major scourge, can only be eliminated by an enlightened and educated public opinion. Malaria and filariasis depend on mosquito eradication in which drainage plays an important part. But all these hygienic measures depend on material prosperity and a new outlook on the part of the peasant. The material prospects of many of the islands are not too good, but a trade in tropical products and a multitude of visitors to what might easily be ideal health resorts would help to counteract the adverse effects of beet and artificial silk on the cane-sugar and cotton industries. The outlook of the negro is another matter, however, which will only be altered after much constant endeavour. Nevertheless, as Dr. Andrew Balfour pointed out in the discussion, considerable advances have been made within the last 30 years and more than would seem possible at the moment may yet be accomplished. These islands are among the beauty spots of the earth. Their soil is fertile and their climate, though tropical, is tempered by the trade winds from the Atlantic. Any effort to make them agreeable health resorts would probably be well repaid.

SURGERY IN THE DIABETIC.

In prolonging the lives of diabetics insulin has increased the number of those who develop surgical complications or coexistent diseases needing surgical treatment. J. A. Reed[1] finds that the surgical mortality-rate has been reduced to one-third of what it was before the use of insulin, but, of course, these patients still run a greater operative risk than normal people. For successful treatment the first essential is close coöperation between the physician and surgeon, both before and after operation. The aim of treatment is to maintain the blood-sugar at its normal level, to promote storage of glycogen by the liver, to overcome ketosis, and to give a sufficient amount of fluid. To accomplish this Reed is accustomed to give a diet containing 100 g. of carbohydrate, the same amount of fat, and 1 g. of protein per kg. of body-weight, with enough insulin to abolish ketosis and bring the blood-sugar to normal level. When this has been done the operation is performed, preferably two hours after the usual breakfast, given in fluid form. In his opinion the anæsthetic of choice is ethylene and nitrous oxide, with ether in cases where greater relaxation is required. After operation the patient should return as soon as possible to his previous diet, while starvation is to be avoided at all costs. In the treatment of diabetic gangrene, Reed again emphasises the importance of early consultation with the surgeon, and points out that to-day infection and gangrene are greater enemies to the surgical diabetic than acidosis and coma. Focal sepsis and arteriosclerosis are the two most important predisposing causes of gangrene, and uncleanliness of the feet is a factor which should not be forgotten. In a paper on diabetic gangrene, B. C. McMahon, Rudolph Scharf, and W. M. Bartlett[2] say that although cases of dry gangrene often recover entirely with adequate medical treatment, gangrene which is tending to spread, or is associated with severe toxæmia or septicæmia, or occurs in a patient whose diabetes cannot be controlled with insulin and diet, should be treated as a surgical emergency. In their series of 19 cases, ten healed by primary and six by secondary union, while one failed to heal in six months. In one of the fatal cases death followed reamputation for secondary gangrene, and in the other it was due to septicæmia. These writers emphasise the importance of radical surgical treatment, bearing in mind the risk of possible reamputation, and for gangrene below the knee they prefer the Stokes-Gritti amputation, both as regards healing capabilities and the giving of a good weight-bearing stump.

NEW VIEWS ON RHEUMATISM IN CHILDHOOD.

One result of the renewed interest in rheumatism is that work in other parts of the world is being studied with more care in this country. As far as rheumatism in the child is concerned many observers think that the disease is much more prevalent here than elsewhere, but it would be rash to conclude from this that knowledge of the disease is confined to these islands. Work in America has attracted attention to the possibility of rheumatism being in the nature of an allergic

[1] Surg., Gyn., and Obst., Jan. 1929, p. 44.
[2] Ibid., p. 125.

phenomenon, and in a paper [1] recently published in Germany Prof. E. Stettner discusses articular rheumatism in children with the same theory in view. Starting with the universally accepted idea that acute polyarthritis is the result of an infection he points out that there must be some other factor present—namely, the reaction of the body to the invading noxious agent. Most authorities ascribe polyarthritis to the presence of some focus of sepsis, but no very clear idea of the nature of the "poisoning" is offered, nor is it explained why various serous membranes should be picked out for disorder. Moreover, infection by the common pyogenic organisms may occur at any age; yet infants and very young children for the most part escape acute rheumatic fever. Stettner believes that this is because the patient must first develop an increased sensitiveness to infection, and that when this is present further infection, even if slight, will produce an allergic polyarthritis. A latent period is necessary during which there are certain chemical changes, and as a result the allergic state develops along with local anaphylactic phenomena in the synovial membranes and endocardium. When the "rheumatic reaction" has thus taken place other factors, such as cold and environmental conditions, may be exciting causes of the acute attack. The influence of heredity has also to be remembered, and in a group of 50 cases specially studied by Stettner for the purposes of his paper there were 20 in which the parents or grandparents had suffered from rheumatism, and 13 in which a history was given of eczema, asthma, and other phenomena of the hypersensitive state. The clinical studies of the cases of polyarthritis under observation brought out other evidence against the idea of a simple infective process. There were many examples of derangement of the capillary blood-vessels, such as peliosis and hæmorrhages from the gastro-intestinal and renal tracts. The blood picture also was not like that of ordinary sepsis; there was only a slight leucocytosis, with no "shift to the left" in the Arneth count and no disappearance of the eosinophils—all three points being opposite to what would be expected in septic infection. Stettner concludes that, in addition to the exogenous factor in rheumatic diseases, there is an altered state of the organism as a whole. Polyarthritis is, of course, seen in other definite diseases such as dysentery or serum sickness, where the type of reaction of the synovial membrane is similar to that of acute articular rheumatism, and such joint changes appear to be part of an allergic phenomenon. The unsatisfactory feature of the hypothesis is the fact that acute joint changes in the rheumatic fever of children in this country are nowadays very rare and the slow insidious onset of rheumatic carditis, often without fever, does not fit in well with the picture of the allergic state presented by Prof. Stettner.

VACCINES IN THE TREATMENT OF ACUTE PULMONARY DISEASE.

A QUARTER of a century ago the medical student looked forward eagerly to the day when pills and potions would give place to vaccines and sera in the treatment of acute and chronic infections. Lectures on pharmacology and demonstrations in the apothecary's shop were of service only in so far as they might help him on the day of trial at the examination hall. In the years to come the laboratory would displace the dispensary as the armoury from which he would draw his weapons. To those instructed by Metchnikoff and Wright the control of infection would become almost as simple as the heart could desire.

In a useful summary of recent French work on vaccine therapy Dr. Georges Rosenthal [2] recalls the familiar argument. An invading army of microbes, assisted by their appropriate toxins, is opposed by a mobilisation of leucocytes supported by the opsonins, agglutinins, and precipitins of the plasma. The issue of the struggle depends on the ability of the leucocytes to engulf and digest the offending micro-organisms, a struggle in which the vital energy of the leucocyte is the all-important factor. If this energy is insufficient the capacity of the white cells may be strengthened by training; the stimulus of pathogenic organisms which have been deprived of offensive power by death or enfeeblement may be used to evoke the latent possibilities of their defence. As Dr. Rosenthal points out, this theory unites the specific and general conceptions of vaccine therapy. It is simple and applicable, and though the results of its application have been disappointing, our disappointment may possibly spring not so much from the inefficacy of vaccines as from generalisations based on insufficient experience. Our French colleagues, who have made a more extended trial of this method, still maintain that it is valuable, and go so far as to say that those who refuse to use vaccines in acute pulmonary disease are guilty of criminal neglect. In the absence of any satisfactory alternative method of treatment the opinion of so many continental physicians should not be ignored.

Theoretically, in applying vaccine therapy we should determine the exact bacterial formula and prepare a vaccine corresponding to a recognised pathological grouping. The struggle against microbe A will be best maintained by a leucocyte trained to engulf microbe A. But the leucocyte stimulated by microbe B will be a better fighter against A than one which has not been so stimulated, especially if A and B belong to allied groups. This explains the benefits attributable to group and non-specific vaccines. An exact formula is difficult to establish and autogenous vaccines involve loss of time in preparation and considerable expense. For practical purposes, therefore, says Dr. Rosenthal, the determination of the principal organisms concerned, and the choice of an appropriate stock vaccine, will suffice. In deciding what is the nature of a pulmonary infection lung puncture may be essential in children whose sputum is swallowed, but in the adult culture from expectorated material may serve. Cultures from the nasopharynx have also been employed on the assumption that all organisms found in broncho-pneumonic areas are also to be found in the upper respiratory tract. Thus L. Duchon holds that whatever organisms may have been responsible for the onset of a broncho-pneumonic attack the terminal fatal aggravation is often due to a descending infection, and he therefore includes the disintegrated Klebs-Löffler bacillus in his vaccine. Unfortunately, Dr. Rosenthal points out, there is a wide divergence of opinion about the best composition of vaccines. Thus Bruschettini recommends an emulsion prepared from intrapleural exudate provoked by the injection of streptococci, staphylococci, pneumococci, and *Bacillus coli*, a method first used against secondary infection in pulmonary tuberculosis. Duchon uses solutions of streptococci exposed to the disintegrating action of *B. pyocyaneus* after filtration forming "lysats vaccins" which contain living antigens. A. Dufort and P. Sédallion maintain that streptococci have no power to provoke the formation of antibodies, while Duchon and A. Mauté submit that the streptococcus is alone responsible for their production. A. Ranque and C. Senès lay chief stress on the importance of the pneumococcus and consider that streptococci only give rise to antibodies if grown in media with ascitic fluid. Thiercelin advises an emulsion of enterococci given by the mouth. Thus the diversity of opinions expressed seems to be only limited by the number of investigators. The best method of introducing the vaccine has also been a matter of dispute, the hypodermic, intramuscular, oral, intravenous, nasal, intratracheal, and transpulmonary routes having all been employed. In transpulmonary inoculation a fine needle with multiple openings is used for the injection of an aqueous isotonic solution, and this is the method which Rosenthal regards

[1] Deut. med. Woch., Feb. 15th, 1929, p. 264.
[2] Arch. med.-chir. de l'appar. resp., 1928, iii., p. 209.

as the best for infants. In adults lipo-vaccines (e.g., oily suspensions of streptococci or pneumococci) may be administered through a fine curved cannula inserted into the trachea, the dosage being similar to that recommended for hypodermic administration.

Dr. Rosenthal concludes that while vaccine therapy has long passed the experimental stage in the treatment of broncho-pneumonia, the problem of the best composition of vaccines has yet to be solved, and this must involve much further work on the part played by various organisms in pulmonary inflammations. Meanwhile he maintains that ignorance and sloth alone are responsible for the prevalent neglect of therapeutic measures of the highest value.

THE BIOLOGICAL ESTIMATION OF TOXICITY.

THE assumption that the efficacy of organic arsenical preparations varies directly with their toxicity has its origin in the circumstances which followed the production in this country, during and after the war, of batches of novarsenobenzene (neosalvarsan). It will be remembered that British manufacturers found the details set out in the patent specifications to be inadequate, and had to rely on the ingenuity of their technical advisers to supplement them. At the request of the Board of Trade the Medical Research Council devised biological tests to ensure that the products on the market were suitable for clinical use. After various experiments, an empirical basis for testing [1] was found. Only such batches were passed as were tolerated by at least four out of five mice in an intravenous dose of 0·3 mg. per gramme of body-weight. Using this method it was discovered that the preparations submitted for testing fell into two well-marked groups. One group resembled the original German product in appearance, solubility, lack of stability when exposed to air, and toxicity. The other group was much more soluble and stable and far less toxic, and for all these reasons achieved a popularity with practitioners which became disturbing when reports began to come in from reliable sources criticising the potency of the material. A test for therapeutic efficacy then became necessary and was adapted from one developed in America. The substances were injected into the veins of mice experimentally infected with the trypanosome *T. equiperdum*, the minimum curative dose being arbitrarily fixed as that which caused disappearance of the organisms from the circulating blood at a period of 72 hours after the injection. By this means it was found that the more stable, less toxic batches of material were inferior in therapeutic value to the older preparations. Clinical trials on syphilitic patients with surface lesions confirmed the results obtained on mice. The manufacturers were fortunately able to remedy the defect when their attention was called to it, but the variations made obvious the desirability, which has since been confirmed, of imposing an official control of potency as well as of freedom from toxicity. Meanwhile the creation of internationally valid standards under the direction of the Health Organisation of the League of Nations has ensured that a substance of uniform strength and toxicity is available for comparison. The International Conference on Biological Standards, which met in Geneva in September, 1925, laid down tests for potency and toxicity, but was unable to prescribe the limits of permissible variation from normal values, since evidence as to the accuracy with which either property could be estimated was lacking.

An attempt to furnish this evidence as regards the toxicity of one substance, novarsenobenzene, has now been made, under the general direction of Dr. H. H. Dale, by a group of workers [2] in the Department of Biological Standards of the National Institute of Medical Research. The task has been found unexpectedly complex. The determination as to what shall be regarded as a lethal dose is the first step—shall it be one which kills any animal, every animal, or some intermediate proportion? Again, even when a characteristic curve relating doses of the standard preparation to death-rate in mice had been determined, how could a test be devised that would discriminate sharply between those samples which conformed to the standard within reasonable limits—say, 20 per cent.—and those whose toxicity was still higher? The work was further complicated not only by the suspicion of variations in sensitiveness between individual animals, but by the possibility of variations due to age, strain, parentage, dietetic history, sexual development, seasonal changes, and sex. Not even weight could be excluded, though the test dosage given was in milligrammes per gramme weight of the experimental animals, for it was discovered that small immature mice had more resistance than mature ones, whose resistance diminished only up to a certain age.

It was found eventually that errors could be to some extent eliminated by choosing mice within narrow limits of body-weight—between 18 and 20 g.—of the same strain and kept and fed under similar conditions. These precautions having been taken, various samples were tested for toxicity against the standard preparations, and an investigation into the tests in current use in various countries was made. The British test hitherto performed is criticised as lacking sharp discrimination, since of batches 50 per cent. more toxic than the standard only two-thirds of the samples are rejected. The German test involves an inconveniently large number of mice. The Japanese test is more lenient than either, but this leniency is neutralised if, as Prof. Hata, of Tokyo, believes, the Japanese mice have a lower resistance than European strains. The official American test is on rats and not on mice. In the light of all this information the onerous task of framing an improved test was undertaken. The final demand of this new test is for a survival of at least 50 per cent. of 30 mice weighing 18 to 20 g. injected with 7·6 mg. per mouse of the sample under examination. The test is conducted in three stages, so that those samples which are practically certain of acceptance or rejection are eliminated after the preliminary test on ten mice; thus as many as 30 mice are needed only for the doubtful samples submitted to further test. Since the details of this method were worked out, the International Conference held at Frankfort in 1928 has agreed to recommend a 20 per cent. excess of toxicity as the limit of tolerance. This is a standard less rigid than was contemplated, but can be met by altering the dose given to each mouse from 7·6 mg. to 7·2 mg. Emphasis is laid on the fact that the true function of the international standard preparation is to test the sensitiveness of the mice which are being used to assess unknown samples, and to provide a basis of comparison between the effects of tests carried out on different species of animals. Finally, in a note on the need for a therapeutic test, it is recorded that one batch of material of such high toxicity that it would not have passed any test was found to have very small therapeutic activity. The conclusion is that while toxicity and efficacy may show a certain parallelism within a limited range of samples of a particular manufacture, it is still necessary to maintain independent tests for both properties in relation to a common standard.

The fact that this intricate work is concerned only with the toxicity of one preparation shows what difficulties lie in the way of a controlled pharmacology of biologicals. It has hitherto resembled the Carrollian game of croquet where flamingoes as mallets hit hedgehog balls which have been only too likely to influence the direction of motion by their own individuality. The business of eliminating or allowing for the variables is well in hand, and provided that the game is not required to be played on the old system of rules, there is no reason why

[1] THE LANCET, 1922, i., 779.

[2] Special Report Series, No. 128. Reports on Biological Standards, II. Toxicity Tests for Novarsenobenzene (Neosalvarsan). By Florence M. Durham, J. H. Gaddum, and J. E. Marchal. H.M. Stationery Office. Pp. 40. 9*d*.

it should not be organised on a plan that all nations can follow. Miss Durham and her colleagues have made a valuable contribution to this end.

STERILITY IN WOMEN.

THE haphazard methods generally employed for the relief of sterility are rapidly being replaced by scientific investigation and rational treatment. It is essential that the medical man should be able to advise his patients from accurate knowledge of the character of the operation required, the prospect of pregnancy following such an operation, and the unavoidable risk entailed. To the principals the importance of the operation depends on their desire to become parents and it is only right that a fair statement of the prospects should be laid before them. Henry Schmitz has lately made a careful survey of the literature of this subject, and though his paper contains no original work, his analysis of 118 papers is certainly worthy of notice. He points out that salpingography was first practised by W. H. Cary who described his method in 1914. After this, little seems to have been done until I. C. Rubin in 1920 published his results of tubal inflation by means of oxygen. Since then, methods of filling the tubes with opaque substances have been revived. Lipiodol, the substance now most commonly employed on account of its harmless properties, was introduced to gynæcological practice in 1925 by Sidney Forsdike who has shown that it is absorbed from the peritoneal cavity without producing any reaction. Some of the most recent work in this country is to be found in his book, "Sterility in Women," which gives a clear account of the information to be got by the intelligent use of gas for inflation of the Fallopian tubes and the radiographic evidence obtainable by the injection of lipiodol into the uterus. Schmitz finds that in 371 cases of salpingostomy reported by 13 authors, pregnancy supervened in about 8·4 per cent. He lays stress on the fact that if there is to be any hope of success the mucosa of the tube must be intact. The treatment in these 371 cases seems to include every type of plastic operation on the tube, and we suggest that when the operation consists merely of freeing adhesions and opening out intact fimbriæ, some word other than salpingostomy should be used to describe it. Forsdike thinks that the prospect of patency being maintained is poor if the operation involves more interference than this. Cases of pregnancy following resection and reimplantation of a tube into the uterus are quoted, but probably this operation is very rarely successful. Both Forsdike and Schmitz mention the occurrence of pregnancy after the grafting of the ovaries into the uterine cornua but neither gives any opinion on the value of the operation.

During the next few years further advances will no doubt be made in the investigation and treatment of sterility. It is to be hoped that accurate statistics of all cases treated and the clinical details of the operative procedure will be given, as well as a record of subsequent pregnancies.

TRAVELLING SCHOLARSHIPS.

THE Chadwick Trustees are inviting applications for two travelling scholarships of £400 a year tenable for one year to be awarded next July, one in sanitary science and the other in municipal engineering. The candidates must be British subjects between the ages of 25 and 30 who have graduated in a British university. These facts have already been announced in our columns, and it may be well to indicate that scholarships to enable students and post-graduates to obtain wider knowledge conducive to international relations in medical science are all too few, so that the opportunity presented by the Chadwick Trustees should make a wide appeal to younger members of the medical profession. The fact that the applicant is required to submit for the approval of the Trustees a scheme of study which he would be prepared to undertake and his itinerary should stimulate the applicant to the intensive study of different aspects of preventive medicine, while successful applicants will have a splendid opportunity of playing their part in helping towards that international reciprocity in medicine, the value of which, and, indeed, whose advent depends upon the clear vision and practical work of its votaries. Applications should be made by letter before March 25th to the clerk of the Chadwick Trustees, 204, Abbey House, Westminster, London, S.W. 1, stating name, qualifications, age, and proposed object of study or research accompanied by copies of testimonials and evidence of previous work undertaken or published.

THE next social evening at the Royal Society of Medicine will be held on Wednesday, March 20th, when the President and Lady Dawson will receive the guests at the Society's house in Wimpole-street. The reception will begin at 8.30 P.M., and at 9.15 Dr. Leonard Williams will give an illustrated address on Napoleon III.

THE Minister of Health of the National Government of the Republic of China, Hsueh-Tu-Pi, has invited Sir Arthur Newsholme, Dr. Louis Rajchman, Secretary of the League of Nations Health Organisation, and Dr. Victor G. Heiser, of the United States Public Health Service, to form an International Advisory Council to assist his Ministry.

WE regret to record the death of Viscount Finlay of Nairn, British member of the Permanent Court of Arbitration at The Hague, and sometime Lord Chancellor of England. The eldest son of William Finlay, F.R.C.P., of Edinburgh, he followed at first his father's profession and graduated in medicine at Edinburgh University before being called to the Bar in 1867. The viscounty descends to his only son, Sir William Finlay, judge of the High Court of Justice.

THE Thirteenth International Congress of Ophthalmology will be held at Amsterdam and The Hague from Sept. 5th to 13th. The main subjects of discussion will be the Ætiology and Non-operative Treatment of Glaucoma, the International Campaign against Trachoma, and the Diagnosis of Suprasellar Tumours, whilst among other topics to be reported on are methods of examining visual acuity, perimetry, determination of axis in astigmatism, examination of the sense of light, standardisation of rules for the examination of railway employees and other workers, and the ophthalmological study necessary for physicians and specialists. Besides the official sessions and receptions a programme has been arranged allowing for excursions and sight-seeing. The secretary of the Dutch National Committee is Prof. W. P. C. Zeeman, Wilhelminagasthuis, Amsterdam.

WOMEN'S HOSPITALS.—The erection of the new Joint Hospital for Women at Liverpool, towards the cost of which £101,000 has been subscribed, will shortly be begun.—Redlands Hospital for Women (the Glasgow Women's Private Hospital), which is staffed and managed by women, last year treated 557 patients, and is in serious need of extension.

WESTERN OPHTHALMIC HOSPITAL.—At the first annual meeting in the new premises in Broad-street, Holborn, held last week, it was stated that, the new hospital being nearly thrice the size of the old one, the cost of maintenance would be almost trebled and would amount to £20,000 a year at least. About £120,000 had been raised, but to clear off debt and provide for the increased cost of working a further £50,000 was needed. The Guild of Gratitude, formed two years ago by the out-patients, numbering 11,000 members, has collected £2500.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLXXXIX.

THE AMBULATORY TREATMENT OF PILES.

APART from the ordinary methods of operation, two different methods of treating piles are in use: (1) injecting the pile mass with various solutions, and (2) cauterising the interior of the pile under local anæsthesia.

In employing any of the procedures which permits the patient to carry on his usual occupation without lying up or using any special precautions, certain conditions must be complied with. The method must not cause the patient anything but a minimum of discomfort, it must be at any rate reasonably efficient in its results, and above all it must be safe, so safe indeed as to be practically fool-proof. Any method, therefore, which offers the least prospect of any complication does not commend itself. Complications which are to be feared are infection of the pile at the time of treatment, with the possibility of abscess formation or, worse still, pyæmia or septicæmia, or necrosis so severe as to result in the separation of a slough with subsequent infection or secondary hæmorrhage.

The Injection of Astringent Solutions.

In order to render the first-named complication—viz., infection of the pile—as remote as possible, it is clear that a powerful antiseptic solution is to be preferred as an injecting medium to any other. It is on this score that I have never used many solutions which have been extensively, and I am sure most successfully, employed by many practitioners. I first used a 10 per cent. emulsion of phenol in liquid extract of hamamelis and water, as recommended by Mr. Dudley Wright,* and later a 20 per cent. solution of phenol as recommended originally by Mr. Swinford Edwards as long ago, I believe, as 1882. This was formerly used with great success by Mr. A. Morley, but I understand from his recent writings that he is now using a weaker solution. That a 10 or a 20 per cent. solution fulfils the first of the requirements stipulated—viz., absolute freedom from any risk of infecting the pile under treatment—is shown by the fact that though I have performed several thousand injections, I have been unable to trace a single instance of abscess formation.

As far as the second complication is concerned—that is, necrosis resulting in the formation and separation of a slough with the possibility of secondary hæmorrhage or infection, or both—I do not think that any particular solution will guarantee immunity. Necrosis may be caused by injecting any solution if the amount injected is too great. The only way of preventing it is by exercising great caution in the quantity inserted. I shall refer to this point later in describing my own technique, which I believe renders the chance of injecting too much so small as to be negligible.

The third complication to be feared—secondary hæmorrhage—I believe to be due, apart from infection, to necrosis, and the only way of preventing it is once again by exercising caution in the amount injected.

The outcome of my experience is, then, that in treating piles by injection, a solution consisting of one part of phenol, two parts of glycerine, and two parts of distilled water can be recommended with confidence. Infection seems almost impossible, and if reasonable caution is employed, sloughing and secondary hæmorrhage need not be feared. This 20 per cent. solution has proved more efficacious in shrivelling up the piles than the 10 per cent., although the 10 per cent. solution gives very good results.

**The Treatment of Hæmorrhoids, H. J. Glaisher, 1913.*

Cauterisation under Local Anæsthesia.

This method is free from the risk of initial infection, as its originators wisely employ an antiseptic solution for producing anæsthesia. The heated cautery is its own sterilising agent. I have employed the method and have found it to be painless and effective. Reports that rather severe secondary hæmorrhage may occur about the fifth day, although only exceptionally and not of alarming degree, have induced me to abandon this procedure. It may be excess of caution, but unless a patient is under continuous observation, I do not care to run even the smallest risk of any complication if any means offer themselves for its avoidance. My own preference, therefore, is for the injection method, using as a medium Mr. Swinford Edwards's solution.

The Type of Pile Susceptible to Injection Treatment.

There are three things of far greater importance from the point of view of the practitioner who is contemplating treating piles by injection than the best medium. The first is the type of pile which is susceptible to this form of treatment, the second the anatomy and mode of development of the only kind of pile which is worth so treating, and the third what period of relief he is in a position to offer a patient who asks for treatment by this method. To dispose of the first question, I am frequently asked whether injections are any good for treating external piles. External piles are composed of skin and contain few blood-vessels, and the interior consists mainly of loose fibrous tissue. Any astringent solution produces its effect, as has been shown by Dr. Cuthbert Dukes, by causing thrombosis of the vessels and aseptic fibrosis of the loose areolar tissue which forms the core of the internal pile. It is therefore obviously impossible to abolish external piles by injection. The injection causes great pain, and unless enough were inserted to produce extensive sloughing, there is no prospect of cure. Such a barbarous method of procedure could scarcely find an advocate to-day. The key to the remaining two questions is to be found in Mr. Ernest Miles's admirable paper published in *Surgery, Gynecology, and Obstetrics* (1919, xviii., 407). The following account is based largely on Mr. Miles's observations. He divides internal piles into three types—each type producing special symptoms.

The First Stage Pile is usually small and is covered by healthy pink mucous membrane and is situated entirely above the muco-cutaneous junction (Hilton's line). The interior of the pile consists of a collection of small arteries, veins, and capillaries embedded in loose areolar tissue. Unless it is of unusual size prolapse does not occur. If, however, the pile is exceptionally voluminous the lower part may prolapse through the anal orifice and become strangulated. The only symptom at this stage is bleeding. The blood is bright red, and may be lost in large quantities. Bleeding usually occurs at defæcation, although exceptionally it may occur at other times.

The Second Stage Pile.—As times goes on, from being constantly dragged upon, the pile increases in length and bulk. The tissue in the region of Hilton's line becomes raised from the subjacent muscle, the vessels become more tortuous and thickened. From repeated friction the mucous membrane becomes thickened and loses much of its bright red colour. The symptoms are less profuse and less frequent bleeding and prolapse of the pile on defæcation with spontaneous reposition at the termination of the act. The pile now becomes of the variety which has been described as mixed—that is to say, it is covered above by mucous membrane and below by skin. The skin-covered portion tends to form an external projection which is always present.

The Third Stage Pile.—The process of enlargement continues. The pile becomes much bigger and a great part of its bulk consists of fibrous tissue. The mucous

membrane becomes still more thickened and purplish in colour. Bleeding is much less frequent and may be entirely absent. The chief symptom is almost intractable prolapse. The pile has to be manually replaced after each action and even then a process of redundant skin protrudes at the margin. The main mass of the pile comes down on very slight exertion, such as coughing, bending to tie up a shoe lace, &c. Patients have frequently told me that they have been compelled to give up playing golf and billiards on this account.

Obviously, it is unlikely that the injection of an astringent solution is likely to have as much effect on the third as compared with the first stage pile. This is borne out by experience. Small first stage piles can be so effectively shrivelled by one or two injections of carbolic acid that one may confidently describe them as being really cured—that is to say, the treated pile will not again appear. This does not mean, however, that the patient will never again suffer from symptoms of piles; it is possible to develop no less than three primary and four secondary pile masses, and a patient who presents himself with, say, three small primary piles, which are successfully treated by injection, is quite likely in the future to develop a fresh crop. I think, however, it is quite possible to save these patients from operation if the piles are treated as soon as they give rise to symptoms. I have a number of cases of such patients treated as long as seven years ago who have not, so far, developed any fresh symptoms. I think the injection method by far the best way of treating the early pile. It is superior to palliative measures such as the use of ointments and regulation of the bowel in that it not merely delays the growth of the pile, but actually shrivels it up.

For the second stage pile such a successful result cannot be expected. Periods which vary in length of immunity from symptoms can, however, be obtained. Anything from two to five years' immunity can be anticipated, when the process of injection can be repeated with further good results. It is a mistake, however, to assure these patients that injection will really cure them, in the sense that for the rest of their lives they will never be troubled again with this complaint.

For the third stage pile much less relief is to be expected. The core of the pile already consists of fairly tough fibrous tissue, and any slight increase in the fibrosis will not be of much value in preventing prolapse, which is the main, if not the only, symptom which calls for relief. Further, the skin-covered portion of the pile constitutes its main bulk. This cannot be injected without causing great pain with no resulting profit. Temporary relief may be obtained by judicious injection of the upper portion of the pile. It is, however, only transient, and if a cure is wished for, operation must be advised.

Summary.

Indiscriminate operation for piles has fallen into disrepute because patients with one or two first stage piles have a few years after operation developed a fresh crop. An example of a patient for whom operation should unhesitatingly be advised is one of, say, 40 years of age, with a long history, who appears with one or more third stage piles and, on proctoscopy, shows more of them. A carefully performed operation should in such a case mean a real cure. Neither injection nor operation can be recommended unless an accurate estimate has been made of the number and stage of development of the piles. Broadly speaking, the advice which should be given to a patient may be crystallised as follows: injection should be recommended for the first stage pile always, for the second-stage pile sometimes, for the third-stage pile never. It is obvious that such a drastic summary requires qualification. For example, a patient aged 80, with troublesome third stage piles, chronic bronchitis, and a weak heart should not be advised to submit to operation when a fair measure of relief can be promised by injection.

The Technique of Injection.

The patient is best treated in the left lateral position. A good head-lamp, speculum, lubricant, ordinary record syringe, and a minim glass to contain the solution are required. The speculum I use is a modification of Allingham's rectal speculum. This is a speculum with an ebony obturator and a lateral slit, which extends the whole length of the speculum. The modification consists in occlusion of that portion of the lateral slit which lies opposite the margin of the anus. In other words, the lateral slit only extends for about three-quarters of the length of the speculum. The occluded portion prevents the loose skin at the anal margin from prolapsing into the lumen of the speculum and thus obstructing the operator's view of the upper part of the pile. I attach considerable importance to the use of this form of speculum. After it has been inserted and the obturator withdrawn, it is possible in a normal anal canal to rotate it through a complete circle with but slight discomfort to the patient, in spite of the relatively sharp margins of the lateral slit.† If any piles are present they prolapse at once through the lateral slit, and, according to the degree of prolapse, an estimate of their magnitude can be made. The speculum should be inserted in the positions in which the presence of a pile is to be anticipated—namely, in the right anterior, right posterior, and left lateral segments of the anal circumference. This involves a triple insertion of the instrument, which is undoubtedly a defect, but one which I do not see how to overcome. I formerly made use of the simple tubular speculum used by Mr. Dudley Wright and Mr. Morley. With this speculum the piles can only be seen at the end of the speculum and, when using it, I have often been in doubt as to whether piles were actually present or whether I was only observing the inevitable involution of normal mucous membrane which must occur in using this instrument. I think the use of a speculum with a lateral slit has undoubted advantages. The pile mass can be clearly demonstrated and a rough estimate formed of its size, and the point of the needle can be accurately inserted to the depth desired. In this way over-distension of the pile with the injecting material, which is probably the main cause of sloughing, subsequent infection, and secondary hæmorrhage, can be avoided.

The injection is made with an ordinary record syringe and a reasonably small hypodermic needle. The point of the needle is inserted about a quarter of an inch into the core of the pile. It is thus an interstitial injection, which is made slowly to allow the fluid gradually to work its way into the substance of the pile. I am sometimes asked if I do not insert a needle into the vein of the pile. The reply, of course, is that there is no vein in the pile, but a plexus of veins. It is a matter of chance whether the point of the needle enters one of these, and of no consequence whether it does so or not. The amount injected varies from 2 to 12 minims, according to the size of the pile. It is impossible to give any guide as to how much should be injected. It is better to err on the side of giving too little rather than too much. The thing to avoid is distending the pile to such a degree that, in the opinion of the operator, sloughing is likely to result. I usually inject two piles at one sitting. The third pile, if present, is injected a week later. The two piles originally injected receive a second injection a fortnight after the first. The process is continued at these intervals until the pile is shrivelled. For a moderate case of three early second stage piles about five or six separate sittings are necessary. Sometimes a small single first stage pile will respond to only one injection. On the other hand, during the last seven years I have injected a well-developed

† I use this procedure as a final test when examining patients I have operated on for piles to prove to my own satisfaction that I have actually removed them all.

second stage pile no less than 21 times, starting with a series of five injections at intervals of a fortnight. The owner of this pile has since been operated upon.

Lubricant.—K.Y. solution, or some form of oxycyanide paste as used for the lubrication of cystoscopes, is the best lubrifacient, since it is more easily removed from the speculum when sterilised by boiling than is vaseline or any oily substance.

Sterilisation of Instruments. — The hypodermic needles are most conveniently sterilised by keeping them in pure spirit. The speculum should be cleansed and boiled for each fresh patient, and also the record syringe. It is not necessary to sterilise the surface of the pile before inserting the needle.

Conclusions.

I would like to say that this indication of my preference for a particular injecting solution or particular technique must not be interpreted as a criticism, direct or indirect, of other methods which have proved highly satisfactory in capable hands. My preference for 20 per cent. carbolic is determined merely by its strong antiseptic powers which should as experience has shown, make its use practically fool-proof. The same considerations apply to my choice of speculum.

Far more important than the actual solution and technique employed, provided they are properly used, is the question of how far the injection method can be advocated as a cure. My own experience, for what it is worth, has led me to the conclusions which have been formulated above.

W. S. PERRIN, M.Chir. Camb., F.R.C.S. Eng.,
Assistant Surgeon, London Hospital.

Special Articles.

THE LOCAL GOVERNMENT BILL:

COÖPERATION OF PUBLIC ASSISTANCE COMMITTEES WITH THE VOLUNTARY HOSPITALS AND WITH THE LOCAL MEDICAL PROFESSION.

THE House of Lords went into Committee on Tuesday, March 5th, on the Local Government Bill, the Earl of DONOUGHMORE in the chair.

Transfer of Functions of Poor-law Authorities.

On Clause 1 Lord HENLEY moved the first of a series of amendments designed to make non-county boroughs and urban district councils with a population of 50,000 or over primary poor-law units as well as county boroughs and counties. He said he believed that this amendment would remove a number of anomalies and tend to improve the administration of the poor-law by providing a larger number of manageable units and by relieving county councils of some of their burdens.

The LORD CHANCELLOR, in resisting the amendment, said that its effect would be to increase the number of poor-law areas contemplated by the Bill from a total of 144 to 193, an addition of more than one-third. That in itself was a retrograde step, and one which was in direct contradiction of the principle of the measure. The whole basis upon which the Government's proposals were to be carried out was that of taking the country and county borough respectively as the unit for the allocation of the finance and for dealing with loss of rates and so on, and the weighting of population for poor relief among other things. Moreover, the amendment would not make for efficiency. One object of getting comparatively large areas into one poor-law area—the whole of the county except the county boroughs—was to enable county councils having a large area with which to deal to choose hospitals in which the different services which might be required for the treatment of disease to be specialised and to be concentrated. There might be in one district of a county comparatively few cases of a particular kind of illness, and yet there might be in the whole county a sufficient number to justify a hospital being devoted to its special treatment. The Minister of Health had given some instances of the very diverse kinds of case which were found being treated in one institution under the existing poor-law arrangement, and one great object which they had was to enable these wide areas to centralise in different suitable institutions the sort of treatment which was desired for particular classes of disease. If they were going to narrow and cut down the areas they would render that task much more difficult of achievement. Further, it would in some cases so emasculate the remaining part of the county, if they took the urban districts with the larger population out of it, that the area left would be quite unable to bear the burden of its poor-law.

Lord THOMSON said what could be done in the case of roads could surely be done in the case of human beings. The poor-law was not to be abolished by this Bill, only the boards of guardians, and the functions of the poor-law were being left to men who were not from their position and general attitude so likely to afford sympathetic treatment to persons who were out of work through no fault of their own. That was the argument for the amendment, and it had not been answered by the Lord Chancellor.

Earl BEAUCHAMP, in supporting the amendment, said that bodies representing areas with a population of 50,000 would be able to provide just that local knowledge of particular circumstances which was very desirable, and yet be in a position to deal with such problems as unemployment in one trade affecting the whole area.

The amendment was rejected by 78 votes to 24.

Coöperation with Voluntary Hospitals: Lord Reading's Amendment.

On Clause 4 the Marquess of READING moved an amendment to insert immediately before the proviso "In so far as such scheme relates to hospitals the council shall take reasonable steps to seek and to continue to secure full coöperation with every voluntary hospital within or serving the area of the council." He said the amendment was of very great importance to voluntary hospitals throughout the country. He moved it with the object of protecting them and of ensuring that there should be full consultation with them before any action was taken that might impair in any degree their usefulness as well as of ensuring that full effect would be given to what he understood was one of the main purposes of the Bill. The whole object of this amendment was to ensure coöperation with the voluntary hospitals and coördination of the various efforts so that there might be no overlapping of the work of, say, rate-supported hospitals, and voluntary hospitals might be consulted in order that the best might be made of existing institutions. The words he desired to insert were almost identical with those which appeared in Clause 27 of the Scottish Bill. When he put down the amendment he thought he was not going counter to the views of the Minister of Health, but rather supporting him, and he was confirmed in that view by finding an amendment on the Order Paper which proposed to insert a clause ensuring that county councils should make such arrangements as they thought desirable for securing that the functions transferred to them should be dealt with in consultation with some body in their area representing the voluntary hospitals. He would like to know whether it was proposed to introduce that provision.

The Earl of ONSLOW (Paymaster-General): It is.

The Marquess of READING said that he thought that the Government were perfectly reasonable in taking this course and that the introduction of this provision would allay the apprehensions of those who were concerned with the voluntary hospitals.

He would like to ask when this amendment had been inserted and the Bill came into effect the Ministry of Health would draw the attention of local authorities to this part of the Bill and particularly to the new provision which was being introduced. The clause as it stood was not mandatory and he was anxious that it should be emphasised that the Ministry were strongly in favour of consultation and coöperation with the voluntary hospitals and that coördination was their desire. It would be wrong to start a rate-supported hospital whose functions would overlap those of the voluntary hospital. This would injure the latter and impair the value of the medical teaching and training, the nursing and medical research which was provided by the voluntary hospital. If Lord Onslow would assure him that it would be made plain that the Government intended that there should be this coöperation and consultation he would be prepared to withdraw this amendment and others standing in his name and accept the Government's proposal.

Lord Dawson's Plea for Representation of the Local Medical Profession.

Lord DAWSON had given notice to add at the end of the clause :—

"A council in preparing a scheme under this section shall have regard to the desirability of consulting (*a*) any body existing in the area which is so constituted as to be representative of the voluntary hospitals in the area, and (*b*) any body existing in the area which is so constituted as to be representative of the duly qualified medical practitioners in the area, including those on the medical and surgical staffs of any voluntary hospitals in the area."

He said that he would speak to the amendment of Lord Reading because it was cognate to the subject of his own. For his part he did not think that the voluntary hospitals required any defence, for their work was known, and without their medical and nursing progress would not exist. If they needed support it was because of the aid that they could bring to the new hospitals which must inevitably arise. He could not contemplate that in the future there would be voluntary hospitals alone, for municipal hospitals must be established. It was true that these hospitals would arise very slowly, but that made it all the more important that in their early beginnings they should have the advantage of consultation with the great voluntary hospitals that at present existed and that they should be brought into touch with their traditions. And if that was to occur, it seems to him essential that those who did know about voluntary hospitals should coöperate with those who had had no experience up to now and who had had little or nothing to do with curative medicine. In times gone by the medical officer of health was the person, and he was now the main person responsible to the council on questions of health. As long as those councils dealt with preventive medicine that was a scheme which would work well enough. But the medical officer of health had no knowledge of curative medicine. He was not competent to deal with it. When, therefore, the councils were going to enter on the foundations of hospitals which would steadily grow year by year, it was surely reasonable to suppose that they needed to bring to the aid of the medical officers of health the assistance of those members of the medical profession who had spent their lives in dealing with the cure of disease. The whole-time medical officers in England and Wales numbered altogether 1740 men, whereas the medical men in England and Wales who were in actual practice numbered 30,000. Was it reasonable to suppose that this great and large work of hospital management into which the councils were going to enter could be undertaken by them without an organic nexus being formed between themselves and those whose lives had been spent in curative medicine? He could not see what objection could be raised to the course he suggested. It was quite easy to find a coherent body of medical men in any district as it was to find a coherent body of those representing the management of the voluntary hospitals. Experience of the poor-law was of little or no help in the administration of a curative hospital. The traditions of the poor-law were quite different. The status of the medical officers was different and they had not had the necessary experience. Indeed, experience of the poor-law might even be a disadvantage in founding a hospital if it was to approximate to the quality and work of the voluntary hospitals. It was along the line of hospitals that he saw progress in attainment of the health of the people, for in dealing with public health it would be more and more necessary to have institutional provision. Improvement in the quality of panel practice as distinct from quantity would depend very largely on the amount of institutional provision. He did not deceive himself by thinking that voluntary hospitals alone were going to be any longer adequate for the medical needs of the country. For that reason, above all others, it was essential that in their early beginnings the council hospitals should get the right tradition as well as the advantage of the long experience which the voluntary hospitals had gained. He was most anxious that there should be some machinery provided of the kind he had indicated and that it should not be left to the free will of the local authority. It should be recorded in the Bill, so that if some Minister of Health should come into office in favour of an entirely nationalised or municipalised medical service for the country it would be more difficult for him to transpose the medical policy of the country. He was not wedded to the words of his amendment, and if Lord Onslow could find some other form which would effect the object he had in view—an object which had the wide support of his own profession—he would be satisfied.

Lord JOICEY said that he was thoroughly in sympathy with the speech of Lord Dawson. At the present moment it was most important that they should not go wrong on this question. He believed that the voluntary hospitals were doing such immense good in the country that it would be a disastrous thing if their great services were not assisted generously where necessary. He certainly would be very much opposed to any hospital which could be established either by a local authority, or by a Government Department, doing anything to interfere with the splendid work which the voluntary hospitals were doing.

Need for the Goodwill of the Medical Profession as a Whole.

Lord ATKIN said he thought that the amendment which had been put down by Lord Onslow was drafted in too restricted a form. The only obligation that would be imposed on the council under that clause was that they should make arrangements for securing that the functions with respect to hospital accommodation would be discharged "after consultation with such body, if any, within the county . . . as they consider to represent the voluntary hospitals in the area." It would seen to follow that if there were no body within the county which could be considered to represent the voluntary hospitals, then no statutory obligation would be placed upon the county council at all, and he suggested that in a good many of the smaller counties it would be impossible to find such a body. No doubt there was a general hospital association, but that was not a body so far as his information went which had county committees or which could be regarded as in any way representative of the special needs of any particular county. It seemed to him that under the restricted form of the Government amendment the county council might very well proceed without consulting anybody. He preferred the words in the Scottish Bill. Moreover, the very much stronger claim which had been made by Lord Dawson was ignored by the Government amendment. It was essential, if this new scheme was to take a real hold and serve a proper part in the future welfare of the country, that it should be done with the goodwill

and coöperation of the medical profession. He supposed that the new municipal hospitals, if founded, would desire, as did the voluntary hospitals, to draw upon the goodwill and services of consultants and specialists, and surely it would be right that the scheme should be devised in the first place after consultation with the medical profession as a whole. The medical profession was organised. The British Medical Association represented for all practical purposes the whole of the profession, and had branches in every county, and therefore there should be no difficulty in regard to consultation.

Viscount KNUTSFORD said that as one who had had some experience of voluntary hospitals, he wished to say that they were extremely anxious to coöperate with the proposals in this Bill. They had no fear of competition; what they desired was that when any new hospital was started it should not overlap and do the same work as the voluntary hospitals. They expected and hoped that the new hospitals would strengthen their weakness and they were anxious to help them to do their work well.

Lord BLEDISLOE appealed to the Government to consider the smaller cottage hospitals and institutions of that type which were doing invaluable work in many parts of the country, sometimes under considerable financial stress, and were not merely serving local requirements but also assisting the counties in their administrative work. He could not help feeling that if consultation was confined to what was called a "body" in the Government amendment, these smaller hospitals would not receive representation.

Lord JESSEL said that the Government amendment seemed very nebulous, and he did not understand in the case of London what would be the proper authority. He should also like to know whether the Government were going to adopt the view so eloquently put forward by Lord Dawson in regard to the representation of the medical practitioners in the country. He hoped that the Government would consider the very strong feeling that there was on both sides of the House on this matter.

Lord GORELL also urged that attention should be paid to the case of the smaller cottage hospitals and that the Government should do something to meet Lord Dawson's point in regard to the medical profession.

The Marquess of READING said that he supported the view of Lord Dawson. The more he looked at the words of the Government amendment the more unhappy he was in regard to them. He suggested that it should not be left to the local auhority to determine the body which should be consulted as representing the voluntary hospitals in the area.

The Government's Reply.

The Earl of ONSLOW said that it was the desire of the Government to encourage as much as possible coöperation between the local authorities and the hospitals which had produced such good results in the past, and from which so much could be expected in the future. The object with which the Government and the Minister of Health was mainly concerned was to make the best use of existing institutions. It was not because of want of sympathy with those objects that the Government had found some difficulty in framing a clause to meet the wishes of noble lords. It was on the question of making statutory provision that the difficulty cropped up. It had been sought in certain quarters to make use of the analogy of Clause 7 (3), which said that county councils should consider the appointment of members of existing poor-law authorities on guardians' committees. If the hospitals had been organised in the same way as the poor-law authorities were to-day, and were statutory bodies defined in law, perhaps that analogy might have been of assistance. But that was not the case. They all knew what was meant by a voluntary hospital, but there was no precise definition of such an institution. When the Voluntary Hospitals Commission was instituted, the first thing they had to do was to devise a definition of voluntary hospitals, and a very difficult task it was. It was rendered more easy because it was done for a special purpose—namely, the distribution of a Government fund to certain institutions which were badly in need of money. The definition worked fairly well, but he did not think that it could be used at the present moment because it did not include such institutions as mental hospitals and other borderline institutions. It seemed, therefore, that the only way of meeting the wishes of noble lords was to draft the clause in as wide terms as possible, making it flexible and adaptable to every area. Areas differed very largely in administration and amount and in regard to their hospital provision. So that the Government proposed in their amendment that county and county borough councils themselves should be the judges of the bodies which might be representative of the voluntary hospitals in their areas for the purposes of consultation. The Minister of Health had authorised him to say that he would use such means as he properly could to bring by circular or otherwise to the notice of the local authorities the provisions of the new clause, and point out to them the desirability of the fullest coöperation with the voluntary hospitals. Under the provisions of the Government's new clause which he would move later, it would be open to councils of counties and county boroughs to enter into consultation with either the local voluntary hospital committees where they were functioning or where they might be resuscitated for the purpose, or with the descendants of those committees, or to utilise the committees of the British Hospitals Association as they existed at the present time, or as he believed they were shortly to be altered. As to the question of the representation of the smaller cottage hospitals, the voluntary hospitals committees, where they functioned, consisted of representatives of the local authorities both county and county borough in the area, of the medical profession, both general practitioners and consultants, of the voluntary hospitals, both of the larger type and of the cottage hospitals. Supposing use was made of the British Hospitals Association committees, any hospital had only to join the Association, a branch of which existed in each area, and its views would be available for the local authorities through that particular channel.

A New Clause at the Report Stage.

With regard to the very important point raised by Lord Dawson, he understood that the noble lord accepted the Government amendment as meeting his views as regarded the first part of his own amendment, but that he had other suggestions to make to the House with regard to the second part. He (Lord Onslow) found it difficult to accept the amendment which Lord Dawson had put down, but he understood that the noble lord did not insist upon the exact words and was ready to accept any form which the Government might put forward which would give effect to his ideas. While unable to propose anything at the moment, he hoped on the Report stage to be able to add to the clause which he had put down words which would provide that some of those who were to be consulted and who should be referred to by the county councils or county borough councils should be representatives of the medical profession in the district. He hoped that the two together would make a clause which would be acceptable to those of their lordships who were so deeply interested and so cognisant of all matters connected with hospitals and their work, and would secure close coöperation and consultation with voluntary hospitals in different districts.

Earl RUSSELL said he thought it was clear to Lord Onslow that it was the general sense of the House that this matter must be settled in a way that would be regarded as satisfactory by those who knew most about it. He had no doubt that the noble earl would take that warning.

The Earl of ONSLOW: We are all equally anxious to have the matter settled in the manner that the noble earl has indicated.

Lord HANWORTH said that the Government's new clause was drawn so loosely that it was quite ineffective. Something of this sort was really necessary :—

"The Council of every county and county borough shall"—

and then they ought to introduce the latter portion of the clause—

"after consultation with such body within the county or county borough as represents the voluntary hospitals in the area, and anybody constituted to be representative of the duly qualified medical practitioners in the area, make such arrangements as they think desirable."

Without some condition of that kind put in at an early stage of the clause it was impossible to carry out the real intention of the House.

The Marquess of READING, in withdrawing his amendment, said he hoped that Lord Onslow would consider what language would adequately meet what the House desired.

Lord DAWSON intimated that he would not move his amendment at that stage. He said that he took that course in the hope that they would get something more out of the Government than good intentions. He did not want them, on the one hand, to dissemble to the medical profession, and on the other to kick them downstairs. The more he looked at the amendment suggested by the Government the more it seemed to fall under that head. It really gave them very little. He hoped that in recasting the clause the Government would fall in with the excellent suggestion of Lord Hanworth and give them something clear and definite which would bring in contact those who were going to administer with those who really knew something about it.

Alternative Powers of Giving Assistance.

On Clause 5 Earl RUSSELL moved an amendment to include any other local or general Act among the Acts mentioned in the first section of the clause.

The LORD CHANCELLOR, in resisting the amendment, said that so far as the Government knew there was only one other Act, except those set out in the clause —namely, the Lunacy Act—which had been deliberately excluded in view of the rather comprehensive legislation relating to the lunacy law which the Government hoped to introduce later dealing with the Royal Commission's Report.

The amendment was negatived without a division.

The New Clause.

On Wednesday, March 6th, the Earl of ONSLOW moved after Clause 12 to insert the following new clause :—

Consultation by councils of counties and county boroughs with bodies representing voluntary hospitals.—"... The council of every county and county borough shall make such arrangements as they think desirable for securing that the functions transferred to them under this part of this Act with respect to the provision of hospital accommodation will be discharged after consultation with such body, if any, within the county or county borough as they consider to represent the voluntary hospitals in the area."

He said that he moved the clause in accordance with the undertaking which he gave to Lord Reading on the previous night. It was subject to the promise given to Lord Dawson that on the Report stage he would add words to provide for consultation not only with the representatives of the voluntary hospitals in the district—that was the county or county borough—but also with the medical and surgical staffs of the voluntary hospitals. He would like this amendment to have the fullest consideration and therefore he begged their lordships to allow him to postpone any further observations until the Report stage.

The Marquess of READING said that he was quite satisfied with the promise of Lord Onslow that he would undertake to consider the language of the clause before the Report stage ; it was a little difficult to accept it as it stood.

The Earl of ONSLOW assured the noble marquess that any observations that had fallen from the noble lords during the previous day's debate would receive the most careful attention.

Lord COZENS-HARDY said that the words "within the county or county borough," and "in the area," would hardly carry out the intentions of the clause. Hospitals, particularly those to which medical schools were attached, had fairly definite spheres of influence, but they very seldon marched with the boundaries of the county or county borough. That point, he thought, should be taken into consideration in reconsidering the words.

Its Wording to be Reconsidered.

Lord DAWSON had given notice to move as an amendment to the proposed clause to add the words : "and with any body existing in the area which is so constituted as to be representative of the duly qualified medical practitioners and of the medical and surgical staffs of the voluntary hospitals in the area." He said that as Lord Onslow had stated that he had not had time to consider the language of this clause, he (Lord Dawson) would suggest to their lordships that it was unwise to commit themselves to a wording which admittedly did not meet the wishes of those who desired the voluntary hospitals to be taken into account. Would it not be better to reconsider the whole matter? If Lord Reading thought otherwise he was prepared to defer to his greater experience.

The Marquess of READING said he would prefer to have the clause inserted at that stage. He was quite content with the statement of Lord Onslow that he would consider the language of the clause before the Report stage when the House would have an opportunity further to consider the matter.

Lord DAWSON said he fully accepted the judgment of Lord Reading in the matter. Lord Onslow, on the previous day, told their lordships that he would try to find words which would meet the words of his (Lord Dawson's) amendment. He would remind the noble earl, since he had said that day that he would try to meet him on the question of the representation of the medical and surgical staffs of the hospitals that that was not all that was wanted. He wanted a body "representative of the duly qualified medical practitioners and of the medical and surgical staffs of the voluntary hospitals." He would add that the people who were concerned with hospitals in that connexion and had experience of them numbered something like 30,000, whereas those who were concerned with whole-time administrative duties, the medical officers of health and other whole-time officials, numbered only about 17,000.

Lord ONSLOW's new clause was agreed to.

Lord DAWSON said he would not move the amendment of which he had given notice.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Health Propaganda.

As it leaves the Commons the Scottish Local Government Bill contains an important new clause enabling county councils and town councils to contribute from the rates to a central body or committee for the purpose of health propaganda. This has arisen out of the arrangement between the Scottish Board of Health and the Scottish Committee of the National Council of Social Hygiene. To this Committee the Board, as the Ministry in England, gave a direct grant for carrying out approved programmes of propaganda. Now the whole burden will be placed on the local authorities, who receive definite powers of contribution. The greater local authorities in Scotland have always been sympathetic to propaganda in their own district against venereal disease, and the V.D Regulations conferred on them full powers to spend money on education and demonstrations of every practicable kind. As they have already found the work of the Scottish Committee highly

satisfactory and as they have never hesitated to send delegates to the conferences, they will probably continue to support the Committee's work on the new footing. The position of venereal disease is peculiar in that a local authority normally has a large proportion of cases coming from outside its own area. There is therefore room for a central propagandist body, which is not in any sense an alternative to the work of the local authority itself. It is also important to add that the new clause applies to all forms of health propaganda. This is new and important. The placing of responsibility for health propaganda on the local authorities, subject to central direction, is really more in the tradition of Scottish administration than the method of direct central grants to independent bodies. The concern about venereal diseases in the various areas is not as acute as it was ten years ago; but curative work is maintained at a very high standard and the loss of popular interest may be balanced by the gain in the popularity of the clinics. One thing is certain—namely, that the local authorities have nowhere used to the full their existing powers of educational propaganda and teaching.

Presentation to Sir Leslie Mackenzie.

On Feb. 23rd Sir Leslie and Lady Mackenzie were entertained to luncheon by the Scottish Branch of the Society of Medical Officers of Health and the Scottish Society of School Medical Officers. Dr. Thomas Adam, President of the former Society, was in the chair, and Sir Leslie received his portrait in oils at the hands of Dr. A. K. Chalmers. In making the presentation Dr. Chalmers spoke of the changes in the work of the Scottish Board of Health during the period in which Sir Leslie was its medical member. With all the principal movements in the public health services in the last 25 years he had been intimately and honourably associated. His inquiries with Prof. Matthew Hay into the physical training of school-children had led to the physical education of the school-child, and here Dr. Chalmers recalled the part Lady Mackenzie had played in promoting the further care of the "toddler." Dr. John Macintyre, President of the Society of School Medical Officers, said that the birth of the school medical service, with which Sir Leslie had been so closely associated, was probably the most outstanding event in State medicine in the last half century, and for that alone their guest would hold a foremost place in the annals of public health administration.

In returning thanks Sir Leslie Mackenzie said that no meeting could give him more profound satisfaction than the present gathering, which represented every phase and stage of his work in the public health and school administration of Scotland. Reviewing some aspects of this work he said that for three years after presenting his report, with Prof. Hay, to the Commission on Physical Training, he had spent a great deal of his time in lecturing on the medical inspection of school-children, to which the profession was at first unfavourable. The younger generation, however, had seen that they had at last succeeded in bringing clinical medicine on to the preventive plane; and inspection gave rise to a demand for treatment. As he had almost all his life from time to time been a teacher and had taught "everything from infants in the elementary schools up to candidates for the Cambridge moral sciences tripos and the London D.Sc., not to speak of arts and medical pupils and the general public," he looked on medical examination and treatment of school-children as among the most important things he had ever had a hand in. Twenty-five years ago everybody was speaking of infant mortality and to-day they spoke of child health or child welfare, and here also as in housing, Sir Leslie Mackenzie was able to claim that he had played a certain part. He concluded by speaking in warm terms of the value of the work done by the civil service.

Lady Mackenzie also expressed her thanks, and Dr. A. S. M. Macgregor proposed a vote of thanks to the painter of the portrait, Mr. Henry Kerr, R.S.A.

The Usher Institute.

Prof. P. S. Lelean's recent lecture to a branch of the Edinburgh Women Citizens' Association on the teaching of sex hygiene was a lucid and effective exposition of the problem and of the necessity for educational action. He has previously spoken on the same subject in Glasgow, under the auspices of the Corporation and the Borough Insurance Committee.

Not long ago Prof. Lelean arranged at the Usher Institute a demonstration of child welfare work for the Scottish medical officers of health, and a special demonstration of teeth and eyes for the school medical officers. For the eye demonstration Dr. George Mackay lent his beautiful and extended series of eye pictures, which are among the best ever made. For the dental demonstration the Dental Board of the United Kingdom lent their fine exhibit of teeth models, which was originally prepared by the Edinburgh Dental Hospital, under Dr. Guy and is available for "Health Weeks" and the like. It is obvious that the Usher Institute is rapidly becoming an active educative centre for medical officers, health visitors, teachers, and others responsible for health demonstrations or propaganda. The museum has now been remodelled to include a permanent exhibition of child welfare and related work.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Infectious Diseases Regulations.

THE Minister for Local Government and Public Health of the Irish Free State has issued Public Health (Infectious Diseases) Regulations to supersede the Regulations issued in 1919. They are to come into operation on April 1st. The following diseases are rendered compulsorily notifiable: acute primary pneumonia, acute influenzal pneumonia, malaria, and dysentery. A case of malaria occurring in an institution and induced for therapeutic purposes is not notifiable, but if such patient leaves the institution while still, in the opinion of the practitioner, liable to recurrences of the disease, the medical officer of health of the district in which the patient is going to reside is to be notified. The fees for notification are 2*s.* 6*d.* for cases occurring in private practice and 1*s.* for cases occurring in the practice of a medical man as medical officer of any public body or any institution. Regulations are made defining the duty of a medical officer of health in regard to investigating the source of infection in cases reported to him, and preventing the spread of infection. Sanitary authorities are empowered to make arrangements for testing susceptibility to diphtheria and administering protective agents. Detailed instructions are given as to the procedure to be adopted by the medical officer of health in dealing with malaria; typhus and relapsing fever; and enteric fever, diphtheria, and dysentery.

The issue of the Regulations is a gratifying evidence of the increased attention given to matters of health by Government authorities in recent years.

Goldsmith and Medicine.

Dr. T. P. C. Kirkpatrick, honorary lecturer in the history of medicine in the University of Dublin, gave a lecture in the School of Physic recently on the relations of Goldsmith and the Medical Profession. He gave a sketch of Goldsmith's life as a student in Trinity College, where he took the degree of B.A. in 1750. His course seems to have been an average one. He had been thanked by the board for his diligence, and he had also been reprimanded. His relations with his tutor were not happy, and it was likely that the menial duties attached to his position as a sizar were galling to one of his high spirit. There was no reason to believe that while at Dublin he contemplated studying medicine, or

that he had any connexion with the School of Physic. In 1752 he began the study of medicine at Edinburgh, and appears to have been a fairly diligent worker. His comments on the teachers of the time are given in a letter to his brother. He left Edinburgh after a couple of years without a degree, but this was the common practice of the time. Whether he ever studied medicine at Padua or elsewhere on the Continent is unknown. At any rate some years later he is found practising medicine at Southwark, but an offer of a surgeoncy in the service of the East India Company fell through on the ground that he had no professional qualification. In 1763 and thereafter he styled himself "M.B.," and though no documentary record has been found to show the source of this degree, Dr. Kirkpatrick thinks it likely that Goldsmith had been granted the degree by the University of Dublin. It was quite in accordance with the practice of the University at the time to grant such a degree in absentia on evidence of study such as Goldsmith was in a position to show, and the records are very imperfect. There is a newspaper paragraph to the effect that he had received the degree of M.B. at Oxford ad eundem, a fact which would be explained if he already had the degree from Dublin. The charge that Goldsmith had misled the authorities of Oxford as to his standing at Dublin is unlikely to be true. Dr. Kirkpatrick closed his lecture with an account of Goldsmith's final illness.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Danger (to the Surgeon) of Cosmetic Operations.

THE case which has recently so disturbed the medical profession and intrigued the public is briefly as follows. A certain Madame Le Guen, formerly employed in an important position by a dressmaking establishment, was meditating matrimony, and in this connexion was greatly distressed over the lack of symmetry of her legs. She consulted an eminent Parisian surgeon, Dr. Dujarrier, and explained to him how suicidal she felt over the situation. Moved by her obvious distress, he consented to perform an operation which would reduce the circumference of her right leg and render her more symmetrical. Her skin proved insufficiently elastic, and the circulation in the limb inadequate. Gangrene supervened, and the leg had to be amputated. On Monday, Feb. 25th, judgment was given in favour of the plaintive patient, who was awarded 200,000 francs damages. In the course of the proceedings a tribute was paid to Dr. Dujarrier's high character by the court, but in the judgment it was pointed out that even if he had committed no mistake in the technique of his operation, he could not escape responsibility for the unfortunate results. In this matter the defence was on the horns of a dilemma; to confess to faulty technique would be to weaken the case; but, on the other hand, if the technique of the operation had been perfect, it followed that Dr. Dujarrier had recommended an operation which, even if conducted with the best of skill, might end in tragedy. As for her suicidal state of mind being a justification for the operation, the court found that this complication suggested the need of psychiatric rather than surgical aid. The lay press is disquieted as well as keenly interested in this judgment which, if it is not reversed by an appeal which is said to be impending, will hamper, if it does not completely paralyse, the cosmetic surgeon. Already heavy fines have been imposed on several skilled radiologists who, in attempting to remove superfluous hairs, have burned their patients' skins. Even the expedient of obtaining from the patient a promise in writing that she will not turn on the doctor and rend him if he is unsuccessful is likely to fail him. For, according to the judgment in the present case, a document containing such a safeguard would be considered invalid on the assumption that the signatory was, at the moment of signing, so set on his or her object that he or she was hypnotised by it, and could, therefore, not be held responsible. Considering how much French surgeons have contributed to the art of plastic and cosmetic surgery in connexion with mutilated victims of the war, it seems hard that this branch of surgery should have become so perilous for the surgeon himself.

Fatal Accidents in the Streets of Paris.

The Parisian Prefecture of Police has just published statistics which show that in 1928 there were 278 fatal street accidents in Paris itself, and 241 in its suburbs. Pedestrians accounted for 68 per cent., cyclists for 14 per cent. and drivers of vehicles for 18 per cent. In 43 per cent. of all the cases the victims were themselves responsible for the accidents, and in the case of pedestrians as great a proportion as 58 per cent. were to blame. A classification of the accidents according to the vehicles concerned showed the following figures: taxicabs, 68, in 32 of which the driver was to blame; private cars, 185, in 105 of which the driver was to blame; heavy vehicles, 151, in 77 of which the driver was to blame; motor-cycles, 23, in 18 of which the rider was to blame; bicycles, 13, in 7 of which the rider was to blame; horse-drawn vehicles, 15, in 8 of which the driver was to blame; tramways, 50, in 9 of which the driver was to blame; motor omnibuses, 13, in all of which death was due to the imprudence or neglect of the regulations on the part of the victim. The most dangerous hours of the day were between 4 and 6 P.M. (80 deaths) and between 6 and 8 P.M. (112 deaths).

MEDICINE AND THE LAW.

Lunacy Certification.

DURING debates on the Local Government Bill it has been stated that the reform of the Lunacy Law is recognised as urgent but cannot be fitted into the Bill and must await the attention of some future Parliament. Some comments by the Chief Constable of Chester during criminal proceedings on March 6th may help to persuade the public that reform is urgent. Two persons were before the court. One was a boy of 18, charged with attempted suicide by cutting his throat in a crowded thoroughfare in the town. The other was a sheep-dealer from North Wales, aged 37, charged with cruelty to sheep by leaving them without food in a field during the recent frosts when five of the animals died of starvation. Both the accused had been under medical observation but, according to the Chief Constable, the doctors, while declaring them to be insane, refused to certify them under the Lunacy Act in view of litigation in the High Court where heavy damages had been awarded against a medical practitioner for alleged negligence in certification. The boy was placed on probation for two years; the sheep-dealer was remanded to prison for further medical observation. The Chief Constable is evidently pessimistic in the present state of the law. Recently, he said, a person was certified at Chester by the prison doctor, but, on the case being sent to the poor-law authority, their medical officer declined to certify.

No reform of the Lunacy Act will eliminate honest differences of opinion among practitioners, but the grant of reasonable protection to the certifying doctor will at least overcome his present hesitation to take a personal part in a procedure which exposes him to heavy financial loss. Meanwhile one may take note of the phenomen on that those concerned in administering the criminal law, who often accuse the medical profession of discovering proof of lunacy too readily, can also complain that the profession is too slow in detecting it.

Injections by Probationary Nurses.

At an inquest at Deptford on March 6th on the death of a woman in the Bermondsey and Rotherhithe Hospital, the coroner (Dr. W. H. Whitehouse) found that death was due to septicæmia following the injection of drugs into the arm as a treatment for heart disease given by probationary nurses at the

hospital. From the evidence of Dr. R. C. Harkness, medical superintendent of the hospital, it appeared that the injections included digitaline and anti-streptococcus serum and that they had been administered by five persons. Four of these were probationary nurses, one in her second year, two others in their fourth year, and the fourth about to take her final examination. Dr. Harkness said he regarded them all as trustworthy. Asked by the coroner why the injections were not given by medical men, he replied that it would not always be practicable as they have to be given at all sorts of hours. Asked why they should not be given by the sister of the ward or staff nurses, he answered that the probationers were under training and must have a certain experience to learn their duties. Probationers, he added, have to give injections in the course of their training and this is usually done under the supervision of the night sister. The coroner observed that it did not seem right that alkaloids like digitaline should be given by probationers in the middle of the night; he thought that a fully trained nurse should be present to supervise such injections. A verdict of "accidental death" was recorded.

MEDICAL SOCIETY OF LONDON.

ANNIVERSARY DINNER.

THE 156th Anniversary Dinner of the Medical Society of London was held in the Empire Rooms of the Trocadero Restaurant on Friday, March 8th, Dr. J. W. CARR, the President, presiding.

The toast of the evening, Prosperity to the Medical Society of London, was proposed by Mr. Justice MCCARDIE, who pointed out that, such was the antiquity of the Society, the earlier dinners would have taken place when Burke was still speaking in Parliament, Johnson was walking down Fleet-street, and Boswell was taking notes. Mr. Justice McCardie recognised as two outstanding qualities in the medical profession their sense of enjoyment of life and their accuracy in their work—to the doctor, he thought Babbage's correction of Tennyson would appeal, when the eminent calculator pointed out to the poet that his well-known lines should have run: "Every moment dies a man; every moment one and one-sixteenth of a man is born." Judges and doctors, he said, alike were occupied in searching for the truth, and in his own case he sometimes found it hard to discover; as, for example, when, in a motor-car accident the usual dilemma was reached, and reached through evidence, that each car had throughout been on its own side of the road, that each car had been under perfect control, and that each car had been stationary for an appreciable time before the collision occurred. Sir Henry concluded by pointing out the gain to society of professional associations, and the certainty that the sense of corporate responsibility and of trusteeship, engendered by them, would develop. In this development of trusteeship the value of tradition would have full play, and, while society as a whole might be on the threshold of fundamental changes, medicine would be safe because of the general recognition of the beneficence of medical aims.

The PRESIDENT, in reply, compared the position of the Medical Society of London, standing without the Royal Society of Medicine, to the position of England, a homogeneous country, and of America, an amalgamation of well-nigh 50 States. He gave his reasons for thinking that the Medical Society had done well in preserving its individuality, and called attention to three particular features by which it was distinguished. First, he said, it possessed a library which housed a unique collection of manuscripts, and of these a proper display had now been made possible by the work of Dr. A. F. Voelcker, the librarian, and Mr. Haines Carter, the secretary of the Society. Secondly, the Society conducted its business with no sectional divisions—its scientific voice was one and undivided. And with regard to the tendency to specialism, indicated by the treatment of disease under sections, Dr. Carr wondered who, when the whole of pathology had been regionally allotted to various specialists, was going to give a general medical opinion, and who was going to educate and examine students on general lines. Thirdly, he said he would refer to what was supposed to be a mediæval characteristic of the Society—namely, that membership was exclusively confined to males—to him a singular situation seeing that, through his official position, he had been instrumental probably in passing into the medical profession so many of the women who might have become members. He admitted that a plebiscite of the Society had recommended their admission, but the inactivity of the council in the matter had met with no protest. Dr. Carr closed his speech by referring to the financial condition of the Society, which, he said, was a very good one, for they had bought their freehold and had every reason to believe that as long as London was an Imperial capital their property would not depreciate. But he suggested that there was room for donations and that immortality could be earned by wiping out the Society's debts.

Mr. WARREN LOW proposed the Health of the Guests, and commenced by stating that the Society had inherited the tradition of hospitality from its founder. Among those whom they welcomed that night, he said, were the Master of the Apothecaries Society, the Presidents of the British Medical Association, the Royal Society of Medicine, the Chelsea Clinical Society, and the Hunterian Society, and the Editors of *The Lancet* and the *British Medical Journal*. Journalism, he said, had now become one of the great professions, and, while the Church made money out of the sins of society, medicine out of its diseases, law out of its misfortunes, journalism, it seemed, throve on its indiscretions. He regretted, however, the place that popular medicine appeared to be trying to play in lay papers, where the life work of a respectable organ like the spleen was trying to replace the details of a divorce case, to which publicity was now refused. He coupled with the toast the names of Lord RIDDELL and Sir EWEN MACLEAN, both of whom replied briefly.

Public Health Services.

INFLUENZA.

THE epidemic is now definitely declining in Manchester and other Lancashire towns, as well as in Liverpool and Cheshire; it is on the wane in most districts of London as well as at Portsmouth. But influenza is still widely prevalent in the North of England, the Yorkshire towns, and the Midlands generally, as well as in some parts of Wales. The epidemic is stated to be at its height at Newport, Isle of Wight; Shropshire is the only locality where it is reported to be on the increase. Nearly all localities report a mild type of the disease, but an increase in pneumonia is noted in some of the Lancashire and Yorkshire towns. In the week ended March 9th the mortality-rate from all causes rose to 41·8 per 1000 in Sheffield and 46·6 in Birmingham, the latter figure being the highest ever recorded in the city.

Abroad a marked increase of the general death-rate and of deaths attributed to influenza occurred in the Rhine area. Towns which normally have a very low mortality are now reporting death-rates as high as 32 in Cologne and 36 in Elberfeld and Barmen. The fall in the death-rates following the decline of the epidemic in Northern Germany, as well as in the Scandinavian countries, has been delayed by the extreme cold which persisted in February. The epidemic seems to be gaining new territory in some of the Baltic districts, the death-rate for Königsberg having gone up to 28. The epidemic, which is mild in character, is extending eastwards in Czecho-Slovakia and Hungary, though now decreasing

in the western parts of these countries. Wurtemberg, Southern Bavaria, and Switzerland are so far little affected. From Denmark comes the news that influenza, although decreasing in the towns, is still increasing in remote rural districts. In Spain the death-rate is still high in certain towns, but the epidemic is now generally on the wane. In Iceland the epidemic reached its maximum at Reykjavik during the week ending Feb. 16th and then declined rapidly. In Madagascar influenza is epidemic at Tamatave and in various inland provinces, but is causing only a few deaths.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 2ND, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 288; scarlet fever, 1958; diphtheria, 1114; enteric fever, 26; pneumonia, 5874 (last week, 4451); puerperal fever, 51; puerperal pyrexia, 146; cerebro-spinal fever, 13; acute poliomyelitis, 8; acute polio-encephalitis, 3; encephalitis lethargica, 23; dysentery, 5; ophthalmia neonatorum, 83. No case of cholera, plague, or typhus fever was notified during the week.

Notifications of pneumonia have again risen considerably, the figures for the last six weeks being 1864, 2422, 3511, 3898, 3658, and 4451. Counties reporting the largest number of cases of pneumonia are as follows: London, 460 (last week 554); Chester, 148 (155); Derby, 106 (53); Durham, 345 (244); Essex, 153 (128); Kent, 130 (92); Lancaster, 862 (783); Leicester, 90 (52); Middlesex, 180 (189); Northumberland, 211 (167); Stafford, 462 (209); Surrey, 14 7(78); Warwick, 552 (313); Yorks, West Riding, 921 (597)—the North and the Midlands contributing most of the increase.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on March 5th–6th was as follows: Small-pox, 41 under treatment, 2 under observation; scarlet fever, 1716; diphtheria, 1912; enteric fever, 10; measles, 65; whooping-cough, 1057; puerperal fever, 15 (plus 4 babies); encephalitis lethargica, 79; poliomyelitis, 8; "other diseases," 63. At St. Margaret's Hospital there were 7 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was no death from small-pox, 3 (0) from enteric fever, 94 (4) from measles, 17 (4) from scarlet fever, 275 (86) from whooping-cough, 48 (4) from diphtheria, 60 (14) from diarrhœa and enteritis under two years, and 2183 (424) from influenza. The figures in parentheses are those for London itself.

The number of deaths from influenza during the previous eight weeks was 99, 122, 179, 321, 652, 987, 1243, and 1764 respectively, the figures for London during the same weeks being 18, 34, 39, 77, 198, 331, 393, and 473. In the week under review deaths were attributable to influenza in Birmingham, 229; Leeds, 139; Sheffield, 74; Stoke-on-Trent, 73; Manchester, 71; Oldham, 57; Leicester, 56; Hull, 45; Sunderland, 37; Bradford, 33; Middlesbrough, 31; Bolton and Newcastle-on-Tyne, each 30. (Glasgow reported only 12, Edinburgh 21, Dublin 19, and Belfast 6.) The figures for the week ended March 2nd to complete the Registrar-General's comparative table of influenza death-rates (printed last week but one) are as follows: Aggregate, 5·78; North, 6·26; Midland, 7·57; South, 4·52; Wales, 1·87; Greater London, 5·04; Birmingham and Liverpool each reported 13 deaths from measles, Sunderland and Cardiff each 7. Deaths from whooping-cough are still widely distributed, the highest figures coming from Bolton and Manchester, each 13; Salford, 12; West Ham and Oldham, each 11; Leeds, 10. No great town has more than 8 deaths to report from diarrhœa.

The number of stillbirths registered during the week was 289 (corresponding to a rate of 43 per thousand births) including 45 in London.

The Registrar-General continues his instructive table showing the number of deaths, especially among old people, from influenza and from respiratory and circulatory diseases in London during the recent severe weather. The supplementary figures (namely, 424, 212; 828, 405; 634, 463) are with the exception of the last all considerably lower than in the preceding week.

Correspondence.

"Audi alteram partem."

THE INJECTION TREATMENT OF VARICOSE VEINS.

To the Editor of THE LANCET.

SIR,—In replying to Prof. Archibald Young's letter I am not a little embarrassed by the fact that my recent Hunterian lecture has yet to appear in your columns. But since your annotation on this lecture has led Prof. Young to such a denunciation of injection methods, I feel it is necessary to answer his charges. The charges levelled against injection treatment are as follows. It is too simple; it is carried out without any or sufficient justification; it is unscientific, therefore unsurgical; the risk of fatal and non-fatal complications is greater than is generally admitted; there are many failures of the method; and, finally, it is not as effective as operation in cases that really require treatment. The very diversity of these charges makes it difficult to believe that the subject has been approached in a detached or critical spirit, and certain of the charges themselves suggest that criticism has been clouded by prejudice.

The only virtue conceded to injection treatment is its simplicity, and this virtue Prof. Young at once converts into a vice in that it may tempt the inefficient to carry out the method. That this simplicity may *conceivably* lead to abuses I admitted in my lecture, but to employ such a type of argument against a new therapeutic measure is paltry. If radium treatment should eventually prove superior to operation in the treatment of carcinoma of the breast, it would be unjustifiable to argue that it should be denied because it is technically simpler than the standard operative procedure. The temptations which lie in wait for the inefficient are not confined to injection treatment.

Secondly, to make the charge that a therapeutic measure *may* be used without any, or sufficient, justification, is to attempt by totally irrelevant means to obscure the issue as to the exact value of that measure. Such charges might be made against many established therapeutic methods, but they do not in themselves detract from the true value of those methods, but are rather reflections on the weakness and cupidity of certain individuals. Prof. Young suggests that treatment given with insufficient justification has gone to swell the statistics, but in a disorder which is fundamentally progressive patients are, as a rule, unwilling to undergo, or surgeons to advocate, operation at a comparatively early stage. At a late stage few surgeons will advise operative treatment. In my own series of over 200 cases more than 50 per cent. were considered inoperable either on account of age, general condition, or owing to the presence of ulcers or dermatitis; 40 per cent. were considered suitable cases for operation; and only 10 per cent. could be classed as early ones—that is, cases in which the surgeon would not advocate and the patient would not willingly accede to operation. Surely from the point of view of rational therapy these early cases are the ideal ones to get before symptoms are severe and before complications have arisen. The preponderance of the other groups is a witness to the failure of operative treatment to deal at all adequately with the situation.

Prof. Young's third contention is that injection treatment is unscientific and therefore unsurgical. His letter does not contain one single argument in support of this statement. If, as I suppose, it is based on the assumption that the production of intravenous thrombosis is necessarily unsound, it is certainly fallacious. What happens in the ordinary ligature and excision operation on varicose veins? The answer is that thrombosis occurs in the blind

ligatured stump of the vein; this thrombosis is mainly due to the stagnation of the contained blood, and for this reason is much more likely to be lightly adherent than when it occurs secondarily to endothelial damage. It is from this stagnation thrombus that pulmonary emboli occur after operative measures.

Fourthly, statistics show that as far as the risk to the patient is concerned it is certain that the chance of embolus occurring after injection treatment is many times more remote than in cases which have undergone the various forms of operation. In any operation involving the ligature of a varicose vein the danger of embolus is never entirely absent, and the incidence is higher than the general incidence of post-operative emboli. If the theoretical danger of pulmonary emboli is to deter us from the treatment of varicose veins, the danger must be given much greater consideration in discussing operative than in discussing injection treatment.

Fifthly, the failures of injection treatment are mustered against the method. The method is new, its employment has been largely experimental, and its technique often halting, and I do not doubt that there have been failures. In my own experience, and I know this is confirmed by that of many others, I have yet to see a case in which I failed to achieve thrombosis and sclerosis of the veins with corresponding relief of symptoms. Failure in this respect is certainly due to faulty technique. Similarly, with proper technique, the local lesions which are sometimes seen, can be reduced to negligible proportions. Applying similar arguments to operative methods, it will be admitted that failure is not unheard of and sepsis not unknown.

Sixthly, Prof. Young calls in question the efficiency of the method in cases which he considers really require treatment. Clinical experience of injection treatment shows here that the functional results obtained are as good as those obtained from ideal operations, and cosmetically much better, to say nothing of the fact that the treatment has been ambulatory.

I will conclude by quoting the sentences from the annotation to which Prof. Young has taken exception.

> This treatment is so simple, so effective, that it has ousted almost completely the treatment by operation . . . on the whole, it can be said that the injection methods now generally adopted are suitable for routine use. The risk is less than operation and the results are better.

The facts as here stated are strictly accurate and based on experience, and since surgery is a practical art, they are not likely to be gainsaid by purely theoretical considerations.

I am, Sir, yours faithfully.

Harley-street, W., March 6th. REGINALD T. PAYNE.

To the Editor of THE LANCET.

SIR,—Everyone with any extensive first-hand experience of the actual operation of the "injection" of varicose veins, and of its results, will unhesitatingly support Dr. Christopher Howard and Sir Sidney Alexander in their disposal of Prof. Archibald Young's objections to that treatment.

To the category of otherwise healthy patients suitable for the injection treatment—viz., those who unshakably (and I think very reasonably) connect their pain, fatigue, discomfort, and unsightliness with their leg varicose veins, whether these be very varicose or not; and those with varicose ulcers; and those (not few) whose varicose veins have recurred after one, or more, excision-operation; and those, often quite young men and women, rejected for some service or other on account of varicose veins, though, as often happens, these veins had so far caused no discomfort or disability; I would add, also from my own practice, one more, "not otherwise healthy"—viz., those middle-aged or even old patients whose activities are curtailed and life made uncomfortable by reason of varicose veins, but whose age and general state of health—e.g., more or less chronic bronchitis—have made, or will make, the surgeon refuse them a general anæsthetic and excision-operation. They can safely be cured of varicose veins by the injection treatment, given cautiously with fewer injections at a sitting and longer intervals between sittings. Their own opinion is that almost a new lease of life is thereby given them.

In fact, with the growing confidence of doctors and public in the treatment and its results, all but one of the above types of varicose vein patients will become rare, instead of as now, common; for the practice of early injection of varicose veins so soon as they appear will become universal. This, however, will often mean injection of quite small varicose veins in "quite young girls"—to Prof. Young's dismay.

I am, Sir, yours faithfully,

H. M. HANSCHELL.

Weymouth-street, W., March 9th, 1929.

SPINAL ANÆSTHESIA IN ABDOMINAL SURGERY.

To the Editor of THE LANCET.

SIR,—A hasty statement of mine in your issue of Feb. 16th concerning the action of gravity and "diffusion" was severely criticised by Prof. Pannett, and as I clearly recognised that the wording was both unscientific and calculated to mislead, I thought that in the circumstances the most graceful, if perhaps not the most sensible thing to do, was to publish an admission of error in your following issue. But I find that Mr. Percival Cole (same issue, p. 468) is so obviously of the same opinion as myself as to the clinical findings and makes the same mistake in the unscientific use of the word "diffusion" that I make no apology for re-entering the discussion and offering what I believe to be the correct solution of the problem.

I am still of the opinion that gravity being a constant is the least important factor in this discussion, and there is no better way of describing the probable progress of novocaine in the theca than by saying that there is a progressively slow downward "diffusion" of novocaine until it comes to a natural extinction by absorption at a certain level proportional to dosage. Referring to the glass-tube experiment, Prof. Pannett states that these results cannot be applied to the human body and gives as his reason the obstructions which the solution encounters in its downward course. He misses altogether the prime factor which differentiates this experiment from a similar one in the body—viz., the rapid absorption by the tissues of the novocaine and the resulting progressive diminution in the specific gravity of the descending fluid. Referring to the body, he states (your issue of Feb. 9th, p. 276):—

> "There is no danger at all of the solution flowing up too high and causing dangerous paralysis. There are large margins of safety in the small size and small dose of novocaine solution and in the fact that the anæsthetic is quickly diminished in strength as it trickles upwards, partly because it becomes fixed by the nerve-roots, partly because of the rapid absorption which takes place from the spinal canal."

If he will allow me I will paraphrase this statement and add considerable meaning to it:—

> When the solution is injected owing to rapid dilution and absorption of novocaine, there is a progressive diminution in the specific gravity of the descending fluid, this results in a progressive retardation of the descent and a consequent increased opportunity for novocaine to be absorbed, until the specific gravity of the advancing column so nearly approaches that of the cerebro-spinal fluid that stasis results in the complete absorption of novocaine at a constant level proportional to dosage.

It will be noted that Prof. Pannett makes use of the expression "trickles upwards." It was in response to this invitation and in opposition to this conception that I left the rigid confines of physical science and used the term "diffusion." Gravity then, although its action is obvious in the early stage as shown by its

immediate effect on the underside in the lateral position, progressively loses its hold on the descending solution and will never take us to the required level unless the dose is adequate to stay the course.

I therefore offer the following theory for criticism. The accomplishment of spinal analgesia falls into three natural divisions :—

1. Block across the *lower lumbar and sacral* nerves for short operations on the perineum, &c.

Interval—the lowest—small dose 5–10 cg.

2. Block across the *root of the cauda equina*, thence involving the roots of the first lumbar and lower thoracic nerves, for operations on the legs, testis, and lower abdomen. For both these divisions no postural arrangement of the body is necessary, the patient lying horizontal, but slight inclination of the body favours paralysis of the upper segments of the rectus muscle. For unilateral operations reinforcement can be obtained by placing the patient on the affected side and keeping him thus during the induction period.

Interval L 1, L 2, average dose 10–12 cg.

3. *Splanchnic* block—up to the fourth thoracic nerve-roots and a little beyond. This requires an inclination of the body sufficient to overcome the dorsal curve, the actual angle being unimportant provided that this condition is fulfilled, though it ought not to be excessive. The level reached is dependent upon the amount of the dose used; this amount should be proportional to the probable size and therefore absorptive power of the nerve-roots in an individual case. Every dose owing to rapid dilution, absorption, progressive diminution in specific gravity, retardation of descent, increased opportunity for absorption, ultimately attains stasis and the novocaine is completely absorbed at a level proportional to the amount of the dose.

Interval L 1, L 2. Dose, 10–12 cg. ; in some big men more. In the event of partial failure a second dose is administered, the amount of such dose to be proportional to the deficiency of the result.

No amount of inclination will bring a small dose to a high level, except in the case of a secondary dose, because previous saturation favours its progress. "Barbotage" results in distributing novocaine below the site of an intended block and should never be used. The above theory is not only in accordance with all clinical findings, but in my opinion reconciles the conflicting views recently expressed in your columns.—I am, Sir, yours faithfully.

W. HOWARD JONES, M.B., B.S. Lond.,
Surgeon Anæsthetist to Charing Cross
March 11th, 1929. Hospital.

To the Editor of THE LANCET.

SIR,—Your correspondents have raised the question of the spread of fluid in the spinal theca. The Saccharine Corporation and MM. Poulenc Frères were so obliging some years ago as to carry out at my suggestion experiments in regard to the density and diffusibility of solutions employed for spinal injection. According to the reports, which I shall be pleased to send to anyone interested, diffusion was extremely slow and may be in practice disregarded. Gravity may come into play to some extent, even if a light solution is used (the 10 per cent. stovaine in saline is often supposed to be as light as the cerebro-spinal fluid), but the fact is, that experiments tell us very little of what happens in the living subject, for various physical, anatomical, and physiological complications are added ; and one may depend upon the practical result, which is, in my experience and that of many others, that a patient may be put into the Trendelenburg position as soon as an injection of stovaine in saline has been given.

I am, Sir, yours faithfully,

London, N.W., March 8th, 1929. J. D. MORTIMER.

TONSILLECTOMY IN CHRONIC ARTHRITIS.

To the Editor of THE LANCET.

SIR,—It is rather surprising that Mr. Pavey-Smith should now state that the figures of his hospital admissions from which I drew certain conclusions, were "rhetorical," as the sentence in his original paper seems plain enough : "During the time that these 200 patients were dealt with *over* 7000 cases of many and various forms of arthritis and allied conditions passed through the hospital" (my italics). Mr. Pavey-Smith now desires to cancel the 7000 and to substitute instead accurate numbers of the various conditions with which he is dealing. This is certainly more satisfactory.

Mr. Pavey-Smith gives 2333 cases of all forms of arthritis admitted. Analysing these one finds that roughly 20 per cent. of acute and subacute rheumatism show tonsillar sepsis, but that in other forms of infective arthritis only 8 per cent. were subjected to operation, 1 per cent. being cured and 4 per cent. obtaining benefit. In one only of some hundreds of cases of osteo-arthritis did the condition of the tonsils warrant interference. With these more exact figures one still finds that in arthritis, with the exception of rheumatic fever, tonsillar infection plays but a very small part. I should like to congratulate Mr. Pavey-Smith on his conservative policy when dealing with this disease.

I am, Sir, yours faithfully,

London, W., March 5th, 1929. H. WARREN CROWE.

OPERATING FOR APPENDICITIS.

To the Editor of THE LANCET.

SIR,—In reply to Prof. Grey Turner, may I endeavour to clear up one or two apparently doubtful points ? In the first place, the cases from which these statistics were compiled were divided into cases operated upon while infection was still confined to the appendix, and "the remainder," which included local abscess, local and general peritonitis. In estimating the ultimate mortality, some slight allowance must admittedly be made for the risk of interval removal, but if sufficient time (about three months), is allowed for infection to subside, then this added risk should be almost negligible.

In my lecture, I dwelt on the possibility of refusal of the patient to undergo interval appendicectomy after expectant treatment had tided him over the crisis, but I believe it is exceptional for subsequent operation to be refused—the memory of recent illness and the fear of recurrence are too vivid. At any rate, we must assume that patients are more or less reasonable, and according to our beliefs, endeavour to pilot them through an illness with the minimum of risk, in the hope that they will continue to follow our advice, and the arguments for interval appendicectomy are certainly clear and weighty.

I heartily applaud Prof. Grey Turner's condemnation of Battle's incision. I purposely refrained from mentioning it, as the sooner it falls into oblivion the better it will be for abdominal walls. I am not conversant with Rutherford Morison's "oblique muscle-cutting incision," but, personally speaking, its strongest recommendation would be to know that Prof. Grey Turner uses it himself.

Mr. Davies-Colley raises one or two points to which I should like to refer, particularly in connexion with operation when infection is localised to the right iliac fossa. Ignoring the high mortality of interfering in localising cases between the third and fifth days (over 9 per cent.), the risk of complications and sequelæ is considerable. When infection is localised efficient protection of the infected area by packing may require very wide exposure in order to avoid breaking down adhesions to the anterior abdominal wall. Infection of this extensive wound, which commonly occurs, is prone to result in incisional hernia. As Mr. Davies-Colley suggests, anxiety to leave structures in situ may prohibit closure of the appendix stump, and as drainage is usually required, the formation of a fæcal fistula is encouraged. When once localisation has occurred, general peritonitis is only likely to follow if a subsequent abscess

ruptures into the peritoneal cavity, provided that the patient is treated on established lines. As stated in my lecture, if an abscess forms and increases in size, then drainage is indicated with a view to obviate this risk, and also to shorten convalescence.

I cannot understand Mr. Davies-Colley's query, "Why drain the pelvis for an infection limited to the iliac fossa?" The point stressed was that *if* pelvic drainage was necessary it should be obtained by a separate suprapubic incision rather than through the original gridiron incision. When infection is localised to the right iliac fossa, if an appendicectomy has been attempted, then a stab wound in the loin provides direct and dependent drainage.

Mr. Hamilton Whiteford refers to the risk of mistaken diagnosis. I agree that when doubt exists, then expectant treatment is unwise; but when infection is limited to the right iliac fossa, and the other three abdominal quadrants appear normal, then the risk of an error in diagnosis is slight, and it is particularly in these localising cases that expectant treatment is advocated. The only two errors of diagnosis which I have personally seen were a volvulus of the cæcum and a twisted ovarian cyst. Both of these cases survived, in spite of a short period of expectant treatment, and I believe that a more careful clinical examination would have resulted in a correct diagnosis.

I am, Sir, yours faithfully,
R. J. McNEILL LOVE.

Harley-street, W., March 12th, 1929.

MEDIÆVAL TOWNS AND SPAS OF GERMANY.

To the Editor of THE LANCET.

SIR,—Attention was drawn in THE LANCET by a news paragraph, which appeared in your issue of Feb. 2nd, to a projected tour at Whitsuntide to the mediæval towns and spas of Germany. This tour I was organising upon the lines of previous expeditions to Czecho-Slovakia and Yugoslavia, and was aiming at having again between 20 and 30 participants. After the appearance of the notice in THE LANCET, a number of doctors wrote to me for details but have not yet decided to go. May I point out that, if the number of acceptances by the end of March falls short of 20, the tour cannot take place, as the agency in whose hands the management lies cannot for any smaller number make the proper and economical arrangements either at hotels or in trains. Prospective travellers should send a deposit of £15 to me at the Bath Club, 34, Dover-street, London, W.1, which will be immediately returned if the numbers still fall short of twenty by March 31st.

I am, Sir, yours faithfully,
HENRY BAERLEIN.

Bath Club, London, W., March 8th, 1929.

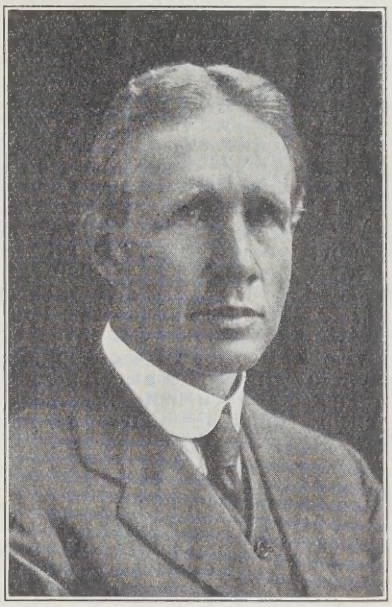
PRESENTATION TO A SURGEON.—Mr. A. W. Nuthall, who was elected surgeon to the Birmingham Children's Hospital in 1904, has just retired under the rules of the hospital after 25 years' service. In recognition of his work he has been appointed an honorary consulting surgeon and presented with a chiming grandfather clock and a drawing-room lamp; a diamond and sapphire ring has been given to Mrs. Nuthall.

IMMUNISATION AGAINST DIPHTHERA IN MANCHESTER.—At the last meeting of the Manchester City Council it was proposed that the medical representatives of the corporation should call meetings both of teachers and of parents and explain to them the advantages of immunisation. Under the scheme sanctioned in June last the education committee was empowered to undertake the prevention of diphtheria by immunisation by the Schick toxoid antitoxin method. At ten of the welfare centres the work is already in progress. Though the treatment has only been available for about six months over 1000 injections have been performed and there has not been any complaint of undesirable after-effects. In some districts the great majority of parents attending certain centres have had their children immunised, and at other centres parents are adopting the idea more slowly.

Obituary.

CLIVE RIVIERE, M.D., F.R.C.P. LOND.

Dr. Riviere, who died at his house in Queen Anne-street on March 6th, was the second son of Briton Riviere, and although he had only recently developed a latent aptitude for water-colour painting, the artistic temperament which he inherited showed itself in every aspect of his work. His bent towards clinical medicine dated from the time when he was house physician at St. Bartholomew's Hospital to Lauder Brunton, the one member of the medical staff at that time who was deeply concerned with the technique of scientific treatment, and when he was clinical assistant to Howard Marsh in the throat department. There followed the usual period of attendance in the "morning surgery" as casualty physician whose task it was to pick out from a mixed mass of suffering humanity the acute and interesting cases, and Riviere became chief assistant in the newly created children's department of the hospital; but he did not stay at Bart.'s. where the prospect of promotion on the medical side then seemed remote, and in 1902 he was appointed out-patient physician at the Victoria Park Hospital, gaining charge of beds in 1916.



DR. CLIVE RIVIERE.
Photograph by Elliott and Fry.

Throughout the 27 years of his career there, as one of his colleagues testifies, he worked hard and unselfishly for the hospital's welfare and was always ready to take on any task asked of him. He was there revealed as a clinical physician who had matured slowly. There was no sparkle or superficial brilliance about his work; he went about it with steady purpose which declined to be put out by hurry or mishap. Joining the staff about the dawn of the tuberculin era, he took an active part in the research which this new remedy entailed and collaborated in a book which still counts as the best treatise in English on tuberculin treatment. That work led him in turn into the field of early diagnosis in tuberculosis, a subject which was then much to the fore as a result of the creation of the dispensary system. Finally the introduction of treatment by artificial pneumothorax into this country by Lillingston and Vere Pearson brought out the best in him. Realising almost intuitively its possibilities Riviere soon became a pioneer and exponent of its technique. His light touch,—for percussion was to him a fine art,—his skilled fingers, and a certain quiet sureness of manipulation, combined to give him a technique which was well-nigh perfect. To these qualities time and experience added a fine clinical judgment, and wherever there was a difficult pulmonary case in hospital his advice was gladly sought by his colleagues. To the new major operations on the chest,

thoracoplasty, and the like, he brought the same mental balance. His opinion, given after much thought, was always sane and free from panic, for he was the least dramatic of men.

Riviere's published writings contain the same elements of success as did his clinical work. The first edition of each of three little volumes issued by the Oxford Medical Publications was soon exhausted and one or more reprints called for by grateful readers. In each case the love of detail and the sense of style which are both clearly visible are subordinated to the purpose of the whole, and the reader does not fail to get a perspective of the subject before him. He never wrote readily, but the third book of the series, on pneumothorax, is a bright example in modern medical writing of a whole which is greater than the sum of its parts.

In his relations with members of his own profession Riviere was happy. The courtesy and obvious sincerity of his motives kept him free from bias in hospital politics, and his sense of fitness saved him from harsh judgments. He disliked show and cheapness in anything, and his love of beauty and skill in art brought out in him a desire for high quality and personal worth. It was this personal worth which endeared him to those who worked with him. "I was greatly struck," writes a surgeon whom he attended professionally, "by the care and thoroughness with which he did his work, by his extraordinary kindness and sympathy, and by the encouragement he gave. During the past 12 years I have had occasion to consult him many times; he was always the same. It is due to his advice and treatment that I regained my health. During the last long illness of one of my family Dr. Riviere came to see him again and again, and did more than I thought possible to relieve his suffering and render his last days tolerable."

The same temperament created an atmosphere of welcome in his home and made him in request where any large scheme of public hospitality was in question. He was joint honorary secretary of the International Medical Congresses held at Lisbon in 1906 and at Budapest in 1909, but the 1913 Congress in London gave him his opportunity as hon. secretary of the Reception Committee; and none of those who attended the enormously successful function at the Natural History Museum, where Mrs. Riviere and he were responsible for the decorations and entertainment, will ever forget their debt. Riviere's charm was heightened by the fact that he held no high opinion of his own qualities or attainments; even among his intimates he only rarely emerged from a kind of constitutional shyness, and his diffidence in impressing his own opinion on others made it impossible for him to make an enemy.

He was only 56 years old when he died at the end of a week's illness from pneumonia, which came as an overwhelming infection from the start, and he leaves the stage at the moment when his powers were at their highest and best.

HENRY ROXBURGH FULLER, M.V.O., M.D. CAMB.

THE death of Dr. Roxburgh Fuller on March 7th brings to an end an extremely long medical connexion with Mayfair. His great-grandfather, John Fuller, is stated to have come up from Dorking to London in about 1767 to study at St. George's Hospital. He practised as an apothecary in Piccadilly, and among his patients was "Old Q," the eccentric William Douglas, fourth Duke of Queensbury. A very interesting account of the famous lawsuit between the executors of "Old Q" and John Fuller is told in a book entitled "Old Q and the Apothecary," by the son of Dr. Roxburgh Fuller, which was printed some years ago. The lawsuit was of the greatest importance to the medical profession, for a direct outcome of it was the passing of the Apothecaries Act of 1815, which settled the legal status of the general practitioner. The lawsuit was the result of Old Q's refusal to be bothered to pay Fuller's fees for his attendance during the last seven years of his life. Fuller was told not to trouble him with accounts, but to recover his charges from the executors, as there would be plenty of money to pay all bills. On Old Q's death Fuller submitted an account of £12,000. The executors did not consider this sum excessive, but thought that it would be best for the case to be brought before the courts, as at that time an apothecary could only charge for the medicines and appliances supplied and not for his attendance. The friendly action resulted in Fuller receiving a sum of £7500. John Fuller died in 1818 and was succeeded in the practice by his son, Henry Peter Fuller, who was a benefactor to St. George's Hospital, and after whom the Fuller ward in that institution is named. He was visiting apothecary to the hospital for many years, as were his son and grandson. He died in 1866, aged 81. To him succeeded his son William Fuller, who took as partner the late F. B. Manley Sims, and shortly before William Fuller's death the subject of this notice joined the firm.

Henry Roxburgh Fuller was born in 1855. He was the son of Dr. H. W. Fuller, physician to St. George's Hospital, and his wife, Emma, daughter of David Roxburgh. He was educated at Eton and Caius College, Cambridge, and received his medical training at St. George's Hospital, where he was house surgeon and resident obstetric assistant. He took the M.B. in 1883, and in the following year joined his uncle and Manley Sims in the historic family practice. In 1886 he proceeded to the M.D. Camb. For some years he was physician-accoucheur to the St. George's (Hanover-square) Dispensary, and as already stated visiting apothecary to St. George's Hospital. Among his patients was H.R.H. the late Duke of Cambridge. The house in Piccadilly, where the Fullers had for so long practised, was pulled down some 40 years ago, and Roxburgh Fuller removed to Curzon-street, where he practised until his retirement.

MUCH regret is felt in Dublin at the death, at the early age of 27, of ANDREW RICHARD JOSEPH DUNGAN, M.D., lecturer in medical jurisprudence in University College, and pathologist to the Mater Misericordiæ Hospital. Having taken his medical degrees at the National University of Ireland in 1923, Dr. Dungan spent some time in America doing research work in biochemistry, and he subsequently studied at Vienna. Since his return to Dublin he had engaged in research work in pathology and biochemistry, and had made several valuable communications to the Royal Academy of Medicine in Ireland, of which he was a Fellow. His communications were marked by thoroughness, originality, and clearness. He was regarded as a young man of great ability and promise, and his early death is a serious loss to the Dublin School of Medicine. Personally he was held in great affection by his friends and colleagues.

Dr. JOHN NOBLE, one of the best-known practitioners in the Birkenhead district, where he had been in practice for over thirty years, died at his home at Rock Ferry on March 2nd at the age of 67. An Edinburgh man, he studied at the University there and graduated M.B. and C.M. in 1884. In 1907 he went to Birkenhead as partner of the late Dr. Robson, of Rock Ferry, subsequently succeeding to the practice. He was a keen sportsman and promoter of outdoor sports, and did much to stimulate bowling and cricket clubs in the district. During the war he was in charge of the Abbotsford Hospital at Rock Ferry and received the M.B.E. in recognition of his services. For many years he was medical officer of the school ship *Conway*, which is moored in the Mersey. Dr. Noble leaves a widow and two sons.

THE death of Dr. WILLIAM HENRY GRIFFITH, of Chester, occurred on March 8th, in his sixty-first year. Born at Meliden, North Wales, he was educated

at Menai Bridge Grammar School and at Bangor. Proceeding to Edinburgh, he studied medicine in the extra-mural school, at the old Minto House, and College of Surgeons, qualifying as L.R.C.P. and L.R.C.S. in 1894. For a short time he practised at Prestatyn and was a member of the first urban council there. He went to Chester about 29 years ago and was a member of the Chester Council for 26 years, being elected alderman in 1921, when he also filled the office of mayor. Dr. and Mrs. Griffith lost their daughter, an only child, about six weeks ago.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT (SCOTLAND) BILL.

THE Report stage of the Local Government (Scotland) Bill was concluded in the House of Commons on Wednesday, March 6th.

Mr. HARDIE moved to omit Clause 68, which provides that "if any difficulty arises in bringing into operation any of the provisions of this Act the Secretary of State may by Order remove the difficulty, or do any other thing which appears to him necessary or expedient for bringing the said provisions into operation."

Sir JOHN GILMOUR (Secretary for Scotland) said that he had several amendments to the clause on the paper which would bring it into conformity with that of the English Bill. He agreed that it would be very undesirable that the powers of the Secretary of State should be so expanded as to become an instrument in the hands of the Minister or officials of his department to defeat the considered and determined view of Parliament. But some discretionary power must be left to the Minister.

At a later stage Sir JOHN GILMOUR moved the amendments to which he had referred, the effect of which was to make the first two subsections of the clause read as follows :

(1) If any difficulty arises in bringing into operation any of the provisions of this Act, the Secretary of State may make such Order for removing the difficulty as he may judge necessary for that purpose, and any such Order may modify the provisions of this Act so far as may appear to the Secretary of State necessary for carrying the Order into effect ;

(2) The Secretary of State may make any adaptations or modifications of the provisions of any Act necessary to bring those provisions into conformity with the provisions of this Act.

The clause was also amended to provide that an Order should not be made after Dec. 31st, 1931.

On the conclusion of the report stage the Bill was recommitted, and on the motion of Major ELLIOT (Under Secretary for Scotland) a new clause was added to the Bill enabling the pension of a sick person under treatment in a poor-law institution to be continued without limit of time.

A second new clause which was added to the Bill read as follows :—

It shall be lawful for any county council or for the town council of a large burgh to incur expenditure in making contributions to the central council or committee of an organisation approved by the Department of Health which provides services of the nature of publicity or educational propaganda for any purpose relating to public health, or in the provision by themselves of such services.

The Third Reading Debate.

In the House of Commons on Monday, March 11th, Sir JOHN GILMOUR (Secretary for Scotland), in moving the third reading of the Local Government (Scotland) Bill, said that with the very best intentions many of the existing local authorities had been incapable of meeting the problems connected with housing and public health matters adequately. Unless there was a coördination of effort there would be wastage and inefficiency. In Glasgow, for instance, he did not see that measure of coördination and coöperation between either the private hospitals or the private hospitals and the public hospitals which was essential if there was to be real efficiency. The provisions of this Bill held out, not only the hope but, in his judgment, the certainty of a great solution of this problem. They had behind them the whole-hearted coöperation of the managers of the great hospitals and of the members of the medical profession who were closely linked with them. In the development of these services he visualised more and more paying wards within the hospitals and the building of annexes in the fresher and purer air of the countryside, to which would be taken at various stages those who first entered the hospitals in the great cities. It was only by complete coördination between the work in the city and the local authorities in the counties outside that they would get a proper solution of this problem. If the Bill had dealt with no other problem than the improvement and coördination of the medical services he would have been proud to have introduced it.

Mr. JOHNSTON, in moving the rejection of the Bill, said that it was with genuine regret that they saw in the measure the disappearance of a training ground for public administration in the form of the small burghs of Scotland. He hoped it would be explained in Scotland that the Government were giving no relief for hospitals, but were giving relief for distilleries ; that treatment of venereal disease would be free, but that maternity treatment would be charged for ; and that if an old man who was treated for bronchitis could not pay, his son or daughter could be called on to pay, or, if they could not pay, then his grandson or granddaughter could be obliged to pay.

Dr. DRUMMOND SHIELS, in seconding the motion for the rejection of the Bill, denied that the change from the percentage grant system to the block grant system was a step forward in regard to the public health services. He could not get away from the fact that the impulse for this change came from the Treasury and not from any medical or local government source. Any saving to the Treasury in public health development meant heavier local burdens out of depleted resources, and that was one of the bad things in the Bill ; even maternity and child welfare could not be saved from it. He was more hopeful about the hospital sections of the Bill than any other part of the Bill. The changes that had been made during the Committee stage, although by no means all that they could have desired, had made some progress possible. The distinction between infectious and other diseases could not be justified, and they could only hope that the local authorities would use their discretion wisely in exercising their powers to enforce payment. Many of the people requiring treatment were already harassed by rent and other obligations ; they needed more money when they were ill rather than to incur new penalties. He regretted especially in this connexion that the Government had not seen their way to exclude maternity hospitals. Presumably there would be paying and non-paying wards in the municipal hospitals, just as there were already in many voluntary hospitals. The voluntary hospitals had reluctantly agreed to the new arrangements, but some of their managers and supporters, and certain eminent members of the medical profession, had been voicing their fears of extinction by the municipal hospitals. No one would deny that splendid work which had been done, and was still being done, by the voluntary hospitals. If it was looked at rightly the new development was not a censure on voluntary hospitals, but was a real triumph of their educational work. They had convinced the community that medical and surgical aid must be promptly and fully available to every member of the population. The voluntary system admittedly could not achieve this, and the community therefore must accept the responsibility. For many years to come there would be need of all the resources of both voluntary and municipal hospitals as there was a very big leeway to make up ; and even if municipal general hospitals ultimately met a large part of the demand there was still abundant pioneer work for voluntarism to do. The public conscience was still dull in regard to crippled children for example, 75 per cent. of whom could be made self-supporting if they were earlier treated. Yet they were languishing in hospitals and private homes throughout the country, a burden and an unhappiness to themselves, and very often a burden on the community. Mental defectives were still largely untouched by any kind of organisation. Rheumatic children, who became very often permanent invalids, were in many cases without any treatment of any kind, or any opportunity of getting it. It was well known that the blind and deaf were also a class who had not yet received the attention which their condition and need warranted. He hoped, therefore, that no dog-in-the-manger policy would attempt to hamper the new municipal and county efforts to do the barest duty to the community. He hoped that the inquiry to which Sir J. Gilmour had referred would not be of a vexatious kind, and would not be such as to hamper the local authority or to mulct them in great costs in endeavouring to meet the medical needs of their people. He agreed that there were difficulties in regard to the coöperation of the voluntary and municipal hospitals, in regard to staff, medical teaching, and many other matters, but that could be surmounted by a spirit of goodwill, which he trusted would be forthcoming.

Reply to the Debate.

Major ELLIOT (Under Secretary for Scotland), replying to that debate, said that he had as much knowledge perhaps of the hospitals and their waiting-lists as almost any Member of the House. He had had the compiling of those waiting-lists. He had realised the hope deferred that made the heart sick as week after week and month after month cases came

up asking for treatment where they knew that treatment would be an advantage, but owing to the shortage of accommodation they were forced to deny it. They were going a great way to remedy that situation by the proposals of this Bill. The Mackenzie Committee reported that no fewer than 700 beds of the first class could be made immediately available if accommodation were arrived at between the municipal and poor-law authorities and the voluntary hospitals, and that it would be possible to bring hundreds of beds immediately into service in Glasgow alone. In Aberdeen it had been possible to bring 160 beds into use and keep them constantly filled. They could do that and even more in other cities under this Bill.

The Bill was read the third time by 269 votes to 86.

The Bill was introduced and read a first time in the House of Lords on Tuesday, March 12th.

HOUSE OF LORDS.

WEDNESDAY, MARCH 6TH.

LOCAL GOVERNMENT BILL.

The House went into Committee on the Local Government Bill, the Earl of DONOUGHMORE in the chair.

[The earlier debate on this and the previous day appears on p. 571 of this issue.]

Recovery of Expenses.

On Clause 15, Lord PARMOOR moved to omit the first subsection, which provided for the recovery of the cost of maintenance and treatment in hospitals. He urged that the obligation which the clause imposed upon local authorities was harsh, and that it would prevent the people for whom the hospitals were intended from seeking treatment.

The LORD CHANCELLOR pointed out that the provision of the clause was not that the county council should recover the cost in all cases, but only in those cases where they were reasonably satisfied that the persons liable could afford to pay. He asked their Lordships to reject the amendment.

After further debate Lord PARMOOR withdrew the amendment.

Lord ARNOLD moved an amendment to make the operation of the clause optional instead of compulsory.

The LORD CHANCELLOR said that although the anomalies that would follow as a result of omitting the clause were very great, if this amendment were carried they would be even greater. Payment would be exacted not according to the means of the patients, but according to the generosity of individual councils.

The Marquess of READING thought that it was a pity that the Government should have made the provisions of the clause mandatory.

Lord SEMPILL pointed out that in the Scottish Bill the power to recover was optional, and it passed his comprehension why it should be optional in one measure and compulsory in another.

The LORD CHANCELLOR said he could not see why the clause should be a deterrent to people going for hospital treatment. The Government thought that the right test of the obligation to recover should rest on the ability to pay.

The Bishop of SOUTHWARK and Lord OLIVIER supported the amendment.

The Bishop of WORCESTER thought that public bodies in assessing the sum which was to be paid would only charge what was reasonable.

Viscount KNUTSFORD pointed out that the voluntary hospitals had no power to recover the expenses of treatment. In London alone, however, 500,000 working men subscribed 13*s.* a year so that when they did go into hospital they might be able to pay voluntary contributions. He could not conceive why some such scheme of assurance should not be applied to the new hospitals—namely, that if people went to them for treatment they should pay unless they were already insured persons.

Lord DAWSON said that as he understood the intention of this clause the word "shall" was meant to compel the county council to consider whether if a person was given hospital treatment he was able to pay. If he could not pay it was in their power to relax payment to such extent as they thought fit. By maintaining the word "shall" the Legislature kept control over the question of policy. He thought it was right for the Legislature to retain its power over local authorities. It was well known that there were certain public bodies in this country who believed in free treatment, just as they believed in free education. If free treatment was a right thing—and that was open to argument—it was a policy which should be determined by the Legislature.

The amendment was rejected by 85 votes to 29.

Definition of Infectious Diseases.

Lord ARNOLD moved an amendment which was designed to secure a better definition in the Bill of what were infectious diseases. The clause as drafted was, he said, ambiguous and unsatisfactory. It would be well, he thought, if the Bill definitely stated what were the diseases in respect of which patients, or those liable for their maintenance, would not be liable for payment. They were, for instance, venereal disease, tuberculosis, and cancer. Venereal disease was accepted as an infectious disease. Of tuberculosis there were two kinds, ordinary and surgical. The former might be deemed infectious, but would surgical tuberculosis come within the same category? In no sense, he thought, could cancer be regarded as infectious, but at the same time in the interests of those suffering from cancer, as well as in the interests of the public, they ought to be treated properly and should not be deterred from entering institutions at the earliest possible moment. He hoped that on the Report stage the Government would be able to define exactly what was meant in the clause by infectious disease.

The Earl of ONSLOW said that venereal disease and ordinary tuberculosis would be treated as infectious diseases, but he could not at the moment say whether surgical tuberculosis would come within that category. He would consider before the Report stage whether it would be possible to adopt Lord Arnold's suggestion of including in the Bill a list defining infectious diseases.

Lord DAWSON said he was very grateful to Lord Arnold for raising this matter, for it provided a very fair example, which he hoped would impress the mind of Lord Onslow, of the importance of having doctors who spent their lives looking after curable disease associated in some way with the medical officer of health from the very moment the local authorities undertook these difficult questions. It proved the point he (Lord Dawson) had tried to raise on the previous day. Turning to Lord Arnold's point about tuberculosis, Lord Dawson said that it would be impossible to draw up a list of what the medical profession regarded as infectious diseases, because knowledge was ever growing, and they might put something in the Bill that day and find that they had to bring in an amending Bill next year. The present opinion would certainly be that there were a large number of cases of tuberculosis which were not in any way dangerous to the health of others. They might be very distressing to the children who suffered from them, and to their parents because of the length of the treatment required, but there were many cases of surgical tuberculosis where the danger of the transmission of the disease to others was a very small one. The same might be said with regard to cancer. The prevailing opinion at the moment was that cancer was not an infectious disease. He was afraid that the words "any serious disease" in Lord Arnold's amendment might be made to include the greater part of the diseases which were treated in the hospitals, and therefore they would have the effect, however remote it might be from the intention of the noble Lord, of altering the word "shall" into the word "may." On those grounds he thought that the amendment was impracticable.

The amendment was withdrawn.

Contributions to Maintenance.

Lord COZENS-HARDY moved to insert at the end of subsection (1):—

"Provided that where there is an association or fund for the support of hospitals or the like any such council or local authority may make agreement with such association or fund that if such association or fund pays to the council or local authority an agreed charge in respect of any inmates entitled to benefits from such association or fund the council or local authority shall not exercise its powers of recovery from such inmate or from any person legally liable for his maintenance. Provided further that the council or local authority shall not so agree to any charge which in its opinion would recover less than the average amount otherwise recoverable from such inmates."

He said that the amendment was intended to help the practical working of those associations with weekly contributions from employers and workmen which had done so much to relieve the financial anxieties of many of the voluntary hospitals. It was usual in those cases to provide that if the contributor was in one of the hospitals concerned no charge should be made for his maintenance, but it was not an infrequent occurrence that a contributor was unable to wait for a bed in a voluntary hospital and had in consequence to go into one of the poor-law institutions; and in such cases it had been found that the contributor certainly expected the fund to repay to him any costs that might have been recovered by the local authority from him for his maintenance. When the poor-law hospitals passed over to the local authorities it was probable, and it was to be hoped, that greater use would be made of them, for the number of these cases was likely to increase. As the Bill stood the local authority was bound to consider the case of each inmate separately—a process which involved the annoyance and the trouble of separate inquiries as to financial circumstances, and a separate collection of a large number of separate charges. The amendment aimed at avoiding all that by empowering the local authority to arrange with the managers of a contributory scheme to collect from the fund a sum equivalent to

that which they would on the average have recovered from the individual contributors.

The Earl of ONSLOW said that the amendment raised a point on which he would not like to offer an opinion without a little further consideration. Therefore he suggested that they should postpone the matter for consideration on the Report stage.

The amendment was withdrawn.

An amendment moved by Lord BALFOUR OF BURLEIGH was agreed to, requiring that town planning schemes should be prepared by Jan. 1st, 1934, or such later date before Dec. 31st, 1938, as the Minister in any case might allow.

THURSDAY, MARCH 7TH.

Supervision of Midwives.

On Clause 57 (Supervision of Midwives), the Earl of HALSBURY moved an amendment to provide that the supervision of midwives should be vested in the county councils instead of in the district councils as provided in the Bill. He said if midwives were put under very small areas their work would certainly take them outside those areas, and they would find themselves under a dual control. The effect would probably be that there would be conflicting rules and regulations made by the two bodies, and the rules regarding disinfection might vary in two different areas. It would therefore be better that they should remain under the larger area. He had read through the part of the Royal Commission's Report dealing with maternity and the question of midwives, and he claimed that his amendment would not be at variance with the findings of the Royal Commission. If the district were that of the local education authority, it would be a district of some size. That undoubtedly would please those who advised the midwives, and who in this matter comprised practically every well-known body concerned with midwifery. The larger the area the broader the view, and the less likelihood of local difficulties being put in the way—such a difficulty as that of a doctor preferring one particular midwife because he was working with her, and employing her to the exclusion of others. Furthermore, it would be much easier to get an experienced inspector for the larger than for the smaller area. They were entitled to look at what had happened in the past. Under the Midwives Act, 1902, there was a power for counties to delegate the inspection of midwives and the general question to a smaller committee. Ten counties adopted that, but after trial every one of them gave it up. In 1909 it was suggested by the Departmental Committee that that delegation to small committees should be given up entirely, and it was repealed by the Midwives Act, 1918. Therefore it was not unreasonable to propose that this suggestion might be considered again before this part of the Bill was passed. He had a further amendment which proposed that if there was any difference between the county council and the district council with regard to a possible Order which might be made by the Minister in accordance with this clause, the Minister should hold a local inquiry into the circumstances.

Lord PARMOOR in supporting the amendment said that transference to the smaller authority would be a mistake. He had before him a document showing that the Incorporated Midwives Institute and every other similar association, was opposed to this provision. The later amendment concerning a local inquiry was a very important safeguard.

Viscount KNUTSFORD said he was authorised to state that the Central Midwives Board and Queen Victoria's Jubilee Nurses objected to this transfer of the powers of the inspection of midwives from the county council to a district council. The Incorporated Midwives Institute and the College of Nursing also opposed it. It was essential to encourage women to join the profession of midwifery. It was not easy to get them, and one thing that would make midwives more happy in their work was that they should feel safe that their supervision should be in the hands of someone who knew how to carry out the duties they had to perform, and the standard they had to work up to. They felt certain they could get better treatment and better supervision from the more important body, the county council, than from a district council.

Lord HUNSDON said that the ladies associated with maternity and child welfare work in Hertfordshire viewed the clause as it stood with something akin to dismay.

The Earl of ONSLOW said the very careful provisions of this clause were based on the recommendations of the Royal Commission. The larger municipal boroughs had felt that they had some cause for displeasure because this duty had been taken away from them. It was to be remembered that under the Act of 1925, which was based upon the first report of the Royal Commission, the size of a county borough was increased from 50,000 to 75,000. Therefore there were a large number of towns approaching the 50,000 limit which would have to wait a long time before there was any hope of their becoming county boroughs. It was to such towns more than others that this particular clause was directed. He did not think it was likely, seeing the careful wording of the clause, that any Minister would transfer the supervision of midwives to any authority unless he was perfectly certain that it would carry out the duties well. The clause was very carefully drawn, and he did not think that the interests of the midwives were likely to be injured by its provisions.

After further debate,

The Earl of ONSLOW said it was clear from the speeches that had been made that there was a great desire for the further consideration of this clause. He suggested, therefore, that they should leave the matter as it stood and allow him to consider with the Minister of Health whether it would be possible to meet the wishes of their Lordships. The matter would be brought up again on the Report stage.

The amendment was withdrawn.

FRIDAY, MARCH 8th.

Discontinuance of Grants.

On Clause 78, Earl BUXTON moved an amendment to exclude grants for maternity and child welfare from the operation of the clause. He said the present system by which a local authority which instituted or enlarged or improved its maternity and child welfare centres received a pound-for-pound grant from the Treasury had proved an enormous stimulus to local authorities. The expenditure on these services had risen in the last few years from £12,000 to over £1,000,000, and the numbers had increased from about 400 to 2634. Under the block grant system proposed by the Bill he thought the local authorities would be discouraged in further extensions and improvements of this important social work.

The Bishop of SOUTHWARK said that this part of the Bill had caused great anxiety among people engaged in maternity and child welfare work. The percentage grant system had worked admirably, and it would be unfortunate to make any change. If the health of the mothers and children was to be properly cared for, there would have to be a great extension of this social work. No doubt many local authorities would encourage the work, but there were others who regarded it with suspicion, and naturally they would be loth to take any steps which would involve increasing their rates.

Lord BUCKMASTER said that the maternal mortality in this country was a disgrace, the ratio compared with that of Holland and Sweden being something like 14 to 2. There was not a medical man who would not tell them that the rate of mortality in childbirth was almost entirely preventible . The reasons for the high rate were ignorance and carelessness. It was only by the continued energetic work of the maternity and child welfare centres that the rate of maternal mortality could be reduced and the health of the children improved. The Bill would rob the good work of its incentive to grow.

The Earl of ONSLOW said they were all agreed on the necessity for maintaining and increasing this important social work, and rendering the centres even more efficient. The amendment would, however, fundamentally alter the Bill, because it would cut into the roots of its financial provisions. It would destroy the principle which the Government deemed better than the system of percentage grants. He did not deny that percentage grants were a stimulus in this work. but they were a stimulus in rich areas. Obviously in a rich district there was more money to be spent, and every pound spent meant another from the Treasury. But that was not the case in the poor areas, where these services were most needed. The Minister had ample powers to bring pressure on a local authority which in his opinion was not adequately supporting this essential work.

The amendment was negatived.

Application of the Act to Exceptional Areas.

On Clause 123, which empowers the Minister of Health to make such Orders as he may judge to be necessary if any difficulty should arise in connexion with the application of the Act to any exceptional area, and to modify the provisions of the Act as far as he considers that to be necessary for carrying the Order into effect

Lord ASKWITH moved an amendment to provide that every Order made by the Minister "shall not be of any effect unless and until a resolution affirming the Order is passed by each House of Parliament."

The LORD CHANCELLOR said that this clause was one which was to be found in some shape or form in a good many recent Acts of Parliament, and it had been proved to be very necessary. But he recognised that, as the clause allowed for the possibility of a modification of the provisions of the Act, it might be advisable that the special attention of Parliament should be called to any Order that was made. He could not accept the amendment in the form in which it had been moved, but he was willing to propose that any Order which was made by the Minister in exercise of the power given in

Clause 123 should be brought to the special attention of Parliament instead of being merely laid on the Table of both Houses, and that there should be a necessity for its confirmation by a resolution of each House of Parliament. An amendment would be brought up on the Report stage to deal with the matter.

The amendment was withdrawn.

The Committee stage of the Bill was concluded, and the Bill was reported with amendments to the House.

TUESDAY, MARCH 12TH.

The Age of Marriage Bill.

The Age of Marriage Bill, introduced by Lord BUCKMASTER, the object of which is to make void marriages between persons under the age of 16, was on the motion of Lord Darling referred to a Select Committee.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 6TH.

Mental Patients.

Mr. DAY asked the Minister of Health the number of lunatics in county and borough asylums, hospitals, or licensed houses at the last convenient date.—Mr. CHAMBERLAIN replied: The number of insane patients on Jan. 1st, 1929, in county and borough mental hospitals, registered hospitals, and licensed houses in England and Wales was as follows: In county and borough mental hospitals, 115,690; in registered hospitals, 2,034; in licensed houses, 2,615; total, 120,339.

THURSDAY, MARCH 7TH.

Dangerous Drugs in India.

Mr. GARDNER asked the Under Secretary of State for India if he would give particulars as to the constitution of the Board of Revenue set up by the Government of India to examine applications for permission to import dangerous drugs into India.—Earl WINTERTON replied: The Central Board of Revenue, which has now been appointed by the Government of India to be the competent authority for the purpose referred to by the hon. Member, was constituted in 1924 under the Indian Central Board of Revenue Act, 1924, for the discharge of various administrative functions relating to income-tax, customs, salt, opium, excise, and stamp duties. The Board, which is appointed by the Governor-General in Council, consists at present of two members.

Lost Insurance Cards.

Sir GEORGE JONES asked the Minister of Health whether seeing that a contributor to the national health and pensions insurance, if he lost his card, must replace the card by stamping a duplicate card for any weeks for which the original card was stamped by his employer, he would, in cases where it could be established by unimpeachable evidence that the lost card had the employer's stamps upon it, arrange for a duplicate card to be issued without the contributor having to go to any expense for stamping.—Mr. CHAMBERLAIN replied: I regret that I cannot adopt my hon. friend's suggestion, as it is essential for the proper working of the health insurance scheme that nothing should be done which might conduce to laxity on the part of insured persons with regard to the care and surrender of their cards.

Medical Examination of Female Aliens.

Lieut.-Commander KENWORTHY asked the Home Secretary what medical examinations were made of women and girls entering British ports from France; under what regulations these examinations were made, and in what cases; if he was aware that there had been indignation in France over the alleged humiliating nature of these examinations in certain cases; and whether he would cause inquiries to be made.—Sir W. JOYNSON-HICKS replied: The Aliens Order, 1920, provides that leave to land in the United Kingdom shall not be given to an alien if a medical inspector certifies that for medical reasons it is undesirable that the alien should be permitted to land; and for the purposes of the Order medical inspectors are appointed by and act under instructions issued by the Minister of Health, with the concurrence of the Secretary of State. Legally every alien, whether arriving from France or elsewhere, is liable to medical examination, but in the absence of special reasons it is the practice only to examine those who propose to stay for a considerable period, and in the case of women and girls the examination, at which a nurse or female attendant is present, is usually of a superficial character. As soon as the complaints appeared in the public press, I caused the fullest inquiries to be made into the matter, in consultation with my right hon. friend the Minister of Health. Responsible officers of the two departments visited the ports, and as the result of their investigation they reported that they could find no foundation for the allegation that the examination of women and girls was of a kind that could be regarded as humiliating. I may perhaps add that there is no examination of women for venereal disease. I am anxious to remove any possible source of friction, and I am considering with my right hon. friend what, if any, modification of the existing instructions might usefully be made.

MONDAY, MARCH 11TH.

Sick Leave among Women Clerks.

Mr. KELLY asked the First Lord of the Admiralty the average number of days of sick leave per head during each of the last three years in the case of women clerical officers, writing assistants, and members of the established typing grades respectively, employed in his department; and what was the average number of days of sick leave per head in the case of each of the grades concerned taken on account of gastric or nervous trouble respectively.—Lieut.-Colonel HEADLAM replied: The average number of days of sick leave per head during the last three years in the case of women clerical officers, writing assistants and members of the established typing grades is as follows:—

	Year ended Jan. 31st.		
	1927.	1928.	1929.
Clerical officers ..	7·0 (*a*)	8·7	8·9
Writing assistants ..	8·5 (*b*)	9·7 (*c*)	5·4
Established typing grades	9·9	8·5 (*d*)	10·7 (*e*)

(*a*) Excluding one woman who had 142 days' sick leave. (*b*) Excluding three women who had 276, 144, and 102 days' sick leave respectively. (*c*) Excluding two women who had 171 and 138 days' sick leave respectively. (*d*) Excluding three women who had 206, 117, and 100 days' sick leave respectively. (*e*) Excluding three women who had 137, 132, and 107 days' sick leave respectively.

Colonel Headlam regretted that he was unable to give the information asked for in the last part of the question.

Mr. KELLY asked the Secretary of State for Air a similar question.—Sir S. HOARE replied: The following table gives the information requested in the first part of the question:—

	Average number of days sick leave per head.		
	1926.	1927.	1928.
Women clerical officers ..	15·9	14·0	14·8
Writing assistants ..	18·0	10·6	16·8
Established typing staff ..	13·1	16·7	14·2

To furnish the information requested in the last part of the question, he said, would involve the scrutiny of some hundreds of medical certificates, and he did not think that the labour involved would be justified.

Deaths from Small-pox.

Mr. GROVES asked the Minister of Health if he would investigate the circumstances attending the statement of the chief medical officer that the number of deaths from small-pox in the first half-year of 1928 were given as 37; and whether he was aware that conflicting figures had been given.—Mr. CHAMBERLAIN replied: The figure of 37 deaths from small-pox in the first half-year of 1928, given in the chief medical officer's annual report for the year 1927, were, as explicitly stated in the report, provisional and before complete returns were available. The figure was based upon a system of classification set out in the report.

Deaths from Post-vaccinal Encephalitis.

Mr. GROVES asked the Minister of Health how many cases of and deaths from post-vaccinal encephalitis had been reported to his department since September, 1927, when the Rolleston Committee on Vaccination ceased taking evidence.—Mr. CHAMBERLAIN replied: During the period from Oct. 1st, 1927, till Dec. 31st, 1928, 65 cases in which symptoms suggestive of disease of the central nervous system following within a month of vaccination have been brought to the notice of my department. Of these cases, 32 were fatal. All cases of this kind are reported to the Departmental Committee, but I am not yet able to say how many of these 65 cases are regarded by the committee as cases of encephalitis following vaccination.

TUESDAY, MARCH 12TH.

Definition of Tuberculosis as Infectious Disease.

Dr. VERNON DAVIES asked the Minister of Health if any other form of tuberculosis, except tuberculosis of the lungs, would be regarded as an infectious disease under the Local Government Bill.—Sir KINGSLEY WOOD replied: My right hon. friend is advised that any form of tuberculosis is an infectious disease for the purposes of Clause 15 of the Local Government Bill. As my hon. friend is aware, tuberculosis is expressly excluded from the definition of infectious disease for the purposes of Clause 58 of the Bill.

The Services.

ROYAL ARMY MEDICAL CORPS.

Col. H. Ensor, late R.A.M.C., has been selected for promotion to Major-General, and for the appointment of Deputy Director of Medical Services, Eastern Command, in succession to Maj.-Gen. W. H. S. Nickerson, V.C., who is placed on the Half-pay List

Lt.-Col. T. B. Unwin, having attained the age for compulsory retirement, is placed on retd. pay.

Lt.-Col. J. M. B. Rahilly retires on retd. pay.

Majs. to be Lt.-Cols.: G. H. Richard, vice Lt.-Col. T. B. Unwin, and W. G. Maydon, vice Lt.-Col. J. M. B. Rahilly.

ARMY DENTAL CORPS.

Temp. Lt. W. G. Martin, Dental Surg., Gen. List, to be Lt.

REGULAR ARMY RESERVE OF OFFICERS.

Lt. J. N. Leitch, from Supp. Res. of Off., R.A.M.C., to be Lt.

TERRITORIAL ARMY.

Maj. F. E. H. Keogh, having attained the age limit, retires, and retains his rank with permission to wear the prescribed uniform.

Lt. H. E. Suter to be Capt.

INDIAN MEDICAL SERVICE.

Capt. (prov.) C. V. Falvey is confirmed in his rank.

Temp. Capt. Daulat Manghirmal Lala relinquishes his temp. commn.

Lt. S. N. Evans resigns his commn.

COLONIAL MEDICAL SERVICES.

The following appointments have been made: Dr. A. W. Dunn and Dr. E. C. Savona, Assistant Medical Officers, British Honduras; Dr. C. S. Davies, Medical Officer, Kenya; and Dr. C. P. Murray, Medical Officer, West African Medical Staff.

NAVAL MEDICAL OFFICERS' DINNER.

The annual dinner of the Royal Navy Medical Club will be held on April 25th at the Trocadero Restaurant. Further particulars may be obtained from Surg.-Comdr. A. T. Rivers, R.N., Medical Department of the Royal Navy, Queen Anne's Chambers, Tothill-street, London, S.W.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on March 9th the following degrees were conferred:—

Sc.D.—Edward Hindle.
M.B. and B.Chir.—G. W. Pimblett and R. G. Apthorpe.
M.B.—W. E. Underwood.
B.Chir.—E. A. E. Palmer.

Mr. N. E. Goldsworthy, Ph.D., has been elected for three years to the John Lucas Walker studentship for the furtherance of original research in pathology.

UNIVERSITY OF SHEFFIELD.—Mr. Vincent Townrow has been appointed lecturer in diseases of the ear, nose, and throat, and Dr. Rupert Hallam lecturer in dermatology.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.—A course in methods of examination and diagnosis will be held at this hospital on certain afternoons between April 10th and 26th.

POST-GRADUATE COURSE ON PÆDIATRICS.—An Easter course on New Views in Pædiatrics will be given at the Hôpital des Enfants Malades, 149 rue de Sèvres, Paris from April 3rd to 13th, under the direction of Prof. Nobécourt. Applications should be sent to the secretary of the Paris Faculty of Medicine.

BAYLISS-STARLING MEMORIAL SCHOLARSHIP.—The University College Committee will award in June a Bayliss-Starling Memorial Scholarship of the value of about £120, with exemption from tuition fees. The scholar will be required to follow a course of study involving a training in the principles and methods of research in physiology and/or biochemistry. Application must be made before May 15th, and information may be had from the Secretary of University College, Gower-street, London, W.C.1.

THE KING has conferred the decoration of the Royal Red Cross (second class) on Miss Rosina Davies, of the London Hospital Nursing Staff, "in recognition of devoted service rendered by her" during His Majesty's illness. The first class of this decoration is reserved for nurses on active service.

WEST LONDON POST-GRADUATE COLLEGE.—The fortnight's course at this College from March 11th to 23rd has been postponed until after Easter, owing to the preoccupation of practitioners with influenza.

INDUSTRIAL NURSING.—An Industrial Nursing Conference has been called by the Industrial Welfare Society and will be held at the Hotel Metropole, London, on April 19th. On the following day visits will be paid to factory clinics.

ROYAL SANITARY INSTITUTE.—On Thursday, March 21st, at 3 P.M., Sir Humphry Rolleston will lecture at this Institute, 90, Buckingham Palace-road, London, S.W., on Industrial Disease and its Prevention.—At a sessional meeting at Birmingham on Friday, April 5th, discussions will be opened by Dr. H. P. Newsholme on Coördination and Coöperation in Preventive Medicine, and by Mr. H. H. Humphries on Some Drainage Problems of Birmingham.

METROPOLITAN ASYLUMS BOARD.—Mr. L. F. Hewitt, Ph.D., has been appointed biochemist at the Board's antitoxin establishment at Sutton. He is at present Gibbons Research Fellow at the London Hospital, where he has also held the Freedom Research Fellowship. Previously he held research appointments under the Medical Research Council and at the Hospital for Sick Children, Great Ormond-street.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—At 3.15 P.M., on Thursday, March 21st, Sir Farquhar Buzzard, Regius professor of medicine in the University of Oxford, will give an address to this society in the anatomy theatre of the medical school of the University of Manchester. His subject will be Tuberculosis and the Nervous System, and the meeting will be open to all medical practitioners.

ROYAL SOCIETY OF EDINBURGH.—Among those who have recently been elected Fellows of this Society are the following: Dr. Sydney Smith, Regius professor of forensic medicine, Mr. Walter Mercer, lecturer in clinical surgery, and Mr. B. P. Wiesner, lecturer in sex psychology in the University of Edinburgh; Prof. E. W. H. Cruickshank, of the Physiological Department of Dalhousie University, Nova Scotia; Mr. D. K. Fraser, psychologist to the Glasgow education authority; and Mr. Thomas Southwell, lecturer in helminthology in the Liverpool School of Tropical Medicine.

DENTAL BENEFIT COUNCIL.—In connexion with the provision of dental treatment for insured persons as an additional benefit under the scheme of National Health Insurance, a body to be known as the Dental Benefit Council has been set up in accordance with Regulations under the National Health Insurance Act, 1928. It will be charged with the duty of making arrangements for securing a satisfactory service of dental treatment for members of approved societies who are entitled to dental benefit and of exercising, subject to the general responsibility of the Minister of Health and the Department of Health for Scotland, supervision over the administration of dental benefit.

WORK OF THE LONDON HOSPITAL.—Lord Knutsford, the chairman, last week reported to the quarterly court of governors that there were 14,583 out-patients—over 2000 less than last year. The quinquennial appeal has produced £118,000, the sum hoped for being £200,000.

BIRMINGHAM AND MIDLAND EYE HOSPITAL.—During the past year a new operating theatre has been built and equipped in order that operations upon septic cases may be segregated from clean intra-ocular operations. A pathological department has also been provided, and the ticket system abolished.

DEVELOPMENT OF DROITWICH.—The Droitwich Development Corporation, Limited, has acquired the whole of the town of Droitwich, including the High-street, with 300 shops and houses, the three principal hotels, the two existing brine baths, with the exclusive brine rights over 3000 acres, the park, the golf links, and many miles of existing roads which await development. Over £1,000,000 will be spent on new buildings and reconstruction in the town and baths. Droitwich is two and a half hours by train from London, and it is intended to have an all-the-year-round season.

MELTON MOWBRAY WAR MEMORIAL HOSPITAL.—As soon as means permit, an entirely new building is to be erected adjoining the present hospital, which will then be used for administrative purposes.

REBUILDING OF TIVERTON HOSPITAL.—It is proposed to erect a new hospital at Tiverton at a cost of £30,000 to hold 50 beds instead of the 35 of the present building. It is to be on the bungalow principle.

SUNDERLAND ROYAL INFIRMARY.—At the annual court of governors the chairman of the medical board emphasised the recent remarkable increase in surgical work, which is now five times as great as on the medical side. In 1923 there were 2190 operations; last year the number was 3763. The number of operations on the intestinal tract is much larger, and in 1928 there were 335 operations for appendicitis, with only three deaths.

MANCHESTER UNIVERSITY STUDENTS' "RAG."—The Shrove Tuesday rag of Manchester Students has resulted in the collection of £11,542 for the local hospitals, a drop of about £1200 on 1928. The sale of *Rag-Rag*, the students' magazine, brought in £6000, which exceeds last year's amount by £1400. Glasgow students' collection produced £17,000, constituting a record since the annual collection began in 1921. In nine years the Glasgow students have collected £87,400 for the local hospitals.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, March 19th.—5.30 P.M., GENERAL MEETING OF FELLOWS. Ballot for election to the Fellowship. 8 P.M., PATHOLOGY. Annual General Meeting: Election of Officers and Council. Communications: G. R. Cameron: The Pars Tuberalis of the Pituitary. L. F. Hewitt: Hormones of the Anterior Lobe of the Pituitary. G. Lenthal Cheatle: The Development of Glandular Tissue in Papillomata of the Breast. L. Colebrook: The Cultivation of Spirochæta Pallida in a Tissue-free Medium. Demonstration: D. M. Pryce: The Halo Method of Determining the Average Size of Red Blood Cells.

WEDNESDAY, 8.30 P.M., RECEPTION. From 8.30 to 9 P.M. Fellows and their guests will be received in the Library by the President and Lady Dawson of Penn. At 9.15 P.M., Dr. Leonard Williams will give an illustrated address entitled Napoleon III. Music and light refreshments. Various objects of interest will be exhibited in the Library.

THURSDAY, 4.45 P.M., DERMATOLOGY and EPIDEMIOLOGY (Cases at 4 P.M.). Special Discussion on Industrial Dermatoses, their Causation, Recognition, Prevention and Treatment. Openers: Dr. W. Dyson (Dermatology). Dr. Sibyl Overton (Epidemiology). Other speakers: Dr. Allan C. Parsons, Dr. Howard Mummery and others. 8.30 P.M., UROLOGY, PATHOLOGY, and THERAPEUTICS. Special Discussion on Urinary Antiseptics. Openers: Dr. Langdon-Brown (Urology). Dr. Cuthbert Dukes (Pathology).

FRIDAY, 4.30 P.M., DISEASE IN CHILDREN. Clinical Meeting at the Royal Free Hospital, Gray's Inn-road, W.C. EPIDEMIOLOGY: No Meeting.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

FRIDAY, March 22nd.—9 P.M., Dr. H. Wordsworth Barber: Dermatology in relation to other Branches of Medicine. (Third Lettsomian Lecture.)

MEDICO-LEGAL SOCIETY.

THURSDAY, March 21st.—8.30 P.M., at 11, Chandos-street, Cavendish-square, W., Prof. Sydney Smith: The Investigation of Firearm Injuries, followed by a discussion.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

THURSDAY, March 21st.—8.15 P.M. (at the Royal Army Medical College, Grosvenor-road, Millbank), Prof. J. W. W. Stephens, and the following, amongst others, will give Demonstrations: Dr. Mary Andrews, Major E. E., Austen, Major H. C. Brown and Dr. W. T. C. Broom, Major S. Elliott, Dr. E. Hindle and A. C. Stevenson. Colonel S. P. James, Colonel W. P. MacArthur, Dr. J. C. Ray, Major D. T. Richardson, Dr. V. B. Wigglesworth.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, March 19th.—5 P.M., Dr. R. A. Young: A Medical Review of the Surgery of the Chest. (First Lumleian Lecture.)

THURSDAY—5 P.M., Dr. R. A. Young: (Second Lumleian Lecture).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, March 18th.—5 P.M., Mr. C. E. Shattock: Specimens Illustrating Disease of the Testis.

FRIDAY.—Prof. Sir Arthur Keith: The Nerve Supply and Movements of the Colon.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, March 18th to SATURDAY, March 23rd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., at 5 P.M., Lecture by Mr. H. W. Carson on Pitfalls on the Right Side of the Abdomen. WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., 4 P.M., Demonstrations by Dr. S. H. Daukes: A Consideration of the Various Methods of Drug Administration. The above are free.—ROYAL EYE HOSPITAL, Southwark, S.E. Afternoon course in Ophthalmology. Daily at 3 P.M., Clinical demonstration. Further particulars from the Secretary of the Fellowship.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, March 18th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace-road, S.W.

THURSDAY, March 21st.—3 P.M., Sir Humphry Rolleston: Industrial Disease and Its Prevention.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, March 19th.—5 P.M., Dr. G. B. Dowling: Mycotic Diseases.

THURSDAY.—5 P.M., Pathology Demonstration.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL Gray's Inn-road, W.C.

FRIDAY, March 22nd.—4 P.M., Mr. Gill-Carey: Foreign Bodies in the Food and Air Passages.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, March 19th.—3.15 P.M., Mr. G. G. Penman: Ulceration of the Cornea.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, March 21st.—4 P.M., Dr. Paterson: The Food Requirements of Infants and Methods of Determination.

NATIONAL COUNCIL FOR MENTAL HYGIENE, 78, Chandos House, Palmer-street, S.W.

WEDNESDAY, March 20th.—5 P.M. (at the Medical Society of London, Chandos-street, W.), Sir C. H. Bond: The Mental Hospital of Today.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, March 22nd.—3.30 P.M. (at the Royal Hospital), Mr. Garrick Wilson: Surgical Cases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, March 19th.—4.15 P.M., Mr. W. R. Douglas: The Acute Abdomen.

FRIDAY.—4.15 P.M., Mr. J. Howson Ray: Demonstration of Surgical Cases.

Appointments.

MEDLOCK, C. H., F.R.C.S. Eng., L.R.C.P. Lond., to be one of the Medical Referees under the Workmen's Compensation Act for St. Albans, Barnet, Hertfordshire, and Watford County Courts.

Certifying Surgeons under the Factory and Workshop Acts: BLAYNEY, W., F.R.C.P. Lond., M.R.C.S. (Harrold, Beds.); CARSON, F. S., M.D. Belf., D.P.H. (Barrow-in-Furness); FLETCHER, C. G., M.B., Ch.B. Edin. (Kippen, Stirlingshire); and STEWART, W. L., M.B., Ch.B. Glasg. (Grampound, Cornwall).

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—H.S. At rate of £100 to £150.

Altrincham General Hospital, Cheshire.—Hon. Physician. Also H.S. £105.

Ashton-under-Lyne District Infirmary.—Res. Surg. O. At rate of £200.

Basingstoke, Hants, Park Prewett Mental Hospital.—Jun. Asst. M.O. £350.

Bedford, Bedfordshire Sanatorium.—Res. Asst. M.O. £400.

Birmingham, Ear and Throat Hospital.—Second and Third H.S.'s. Each at rate of £150.

Birmingham, General Hospital.—Res. Anæsthetist. £120. Also four H.S.'s Each £70.

Birmingham, Queen's Hospital.—Anæsthetist. At rate of £70 to £100. Also three H.S.'s. At rate of £70.

Blackburn and East Lancashire Royal Infirmary.—Res. H.P. £150.

Bristol City Mental Hospital.—Third Asst. M.O. £300.

Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.

Cancer Hospital, Fulham-road, S.W.—Anæsthetist.

Cardiff, City Mental Hospital, Whitchurch.—Research Chemist. £800.

Chelmsford and Essex Hospital.—Res. M.O. £150.

Chester, Royal Infirmary.—Hon. Asst. Physician.

Coventry, Coventry and Warwickshire Hospital.—Hon. Physician.

Derby, Derbyshire Hospital for Sick Children.—Hon. P. and Pathologist. Hon. Ophth. S. Also Hon. S. to Ear, Nose and Throat.

Doncaster, Royal Infirmary.—Third. H.S. At rate of £150.

Dreadnought Hospital, Greenwich, S.E.—H.P. and H.S. Each at rate of £110.

Dumfries, Crichton Royal Mental Hospital.—Clinical Pathologist. £400.

East Ham Education Committee.—Aural Surgeon. Also Ophthalmic Surgeon. Each 3 guineas per session.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Asst. Obstetrician.

Evelina Hospital for Children, Southwark, S.E.—H.S. £120.

Exeter, Royal Devon and Exeter Hospital.—H.P. At rate of £130

Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Second H.S. At rate of £100.

Hastings, Royal East Sussex Hospital.—Pathologist. Asst. Physician. Also M.O. to V.D. Department.

Hereford, Herefordshire General Hospital.—H.S. £150. Also H.P. At rate of £100.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also H.S. and H.P. At rate of £100.

Hull, Sculcoates Union Institution, Beverley-road.—Non-Resident Sen. M.O. £700.

Inverness Royal Infirmary.—Hon. Surg.

Italian Hospital, Queen-square, W.C.—Hon. Anæsthetist.

Leeds Tuberculosis Sanatorium, Killingbeck.—Asst. Res. M.O. £250.

Leicester Royal Infirmary.—H.P. £125.

Lewisham Hospital, S.E.—Fifth Asst. M.O. £300.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

L.C.C. Mental Hospital Service.—Eighth Asst. M.O. £300.

London Temperance Hospital, Hampstead-road, N.W.—H.P. At rate of £100.

Manchester Babies Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Manchester Royal Infirmary.—Res. Surg. Officer. £200.

Mexborough, Yorks, Montague Hospital.—H.S. £120.

Middlesex Hospital, W.—Sen. Res. Asst. Anæsthetist. At rate of £120.

Miller General Hospital, Greenwich-road, S.E.—Hon. Asst. Dental Surgeon.

Newcastle-upon-Tyne, University of Durham College of Medicine.—Asst. in Pub. Health Labs., &c. £350–£450.

Oxford, Radcliffe Infirmary and County Hospital.—Hon. Asst. Surgeon.

Oxford, Wingfield Orthopædic Hospital, Headington.—H.S. £150.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Anæsthetist. £20. Also Hon. Dermatologist.

Reigate Borough.—Medical Officer for Maternity and Child Welfare Centre. £150.

Richmond, Surrey, Royal Hospital.—Sen. H.S. Also Jun. H.S. At rate of £150 and 900 respectively.

Royal National Orthopædic Hospital, 234, Great Portland-street, W. Hon. Asst. S.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Surgical Registrar.

St. Marylebone General Dispensary, 30, Marylebone-lane, W.—Physician to Dermatological Department.

St. Thomas's Hospital, S.E.—Asst. Surgeon in Orthopædic Dept.

Salisbury General Infirmary.—Two H.S.'s. Each £150.

Salop County Council.—Asst. M.O. £600.

Sheffield, Royal Infirmary.—Surgical Registrar. £200.

South London Hospital for Women, South Side, Clapham Common, S.W.—H.P. and Three H.S.'s. Each at rate of £50.

Southampton Children's Hospital.—Res. M.O. £100.

Southern Rhodesia Government.—Asst. Schools Dental Surgeon. £600 +50—£750 per annum.

Swansea Hospital.—H.S. £150.

Torquay, Torbay Hospital.—Hon. Physician, Hon. Surgeon. Hon. Asst. M.O. Also Hon. Anæsthetist.

West London Hospital, Hammersmith-road, W.—H.P. and Two H.S.'s. Each at rate of £100. Non-Res. H.O. for Children's Department. 5 guineas weekly. Also Hon. Asst. Anæsthetists.

The Chief Inspector of Factories announces a vacancy fo a Certifying Factory Surgeon at Littleport (Cambs.).

Births, Marriages, and Deaths.

BIRTHS.

ALABONE.—On March 6th, at "Brent Tor," Dyke-road, Hove, the wife of Leslie Alabone, L.D.S.R.C.S.Eng., of a daughter.

ELKINGTON.—On March 4th, at Welbeck-street, the wife of Capt. E. H. W. Elkington, R.A.M.C., of a daughter.

GRAY.—On March 5th, at Westerhall, Weymouth, the wife of Adam Gray, M.D. Aberd., of a son.

HUGHES.—On March 5th, at The Mall, East Sheen, the wife of Royston Hughes, L.D.S. Eng., of a daughter.

MARRIAGES.

CRADDOCK—JOYCE.—On March 2nd, at St. Mary's, Paddington, Stuart Craddock, M.B., B.S., M.R.C.S., L.R.C.P., to Lilian Margaret Heath Joyce.

EMERY—STEWART.—On March 2nd, at Regent-square Presbyterian Church, W.C., Clyde K. Emery, B.A., M.D., M.R.C.S., L.R.C.P., to Wendy Stewart, B.Sc., daughter of Dr. and Mrs. A. A. Stewart, of Northampton.

DEATHS.

COOMBS.—On March 3rd, at Bedford, Rowland Hill Coombs, M.D., M.R.C.P., D.L., J.P., aged 84.

DIXON.—On March 8th, at The Bungalow, Stevenage, George Frederick Dixon, M.R.C.S., L.R.C.P., in his seventy-third year.

DOYLE.—On Jan. 29th, 1929, at Sydney, in the seventieth year of his age, The Honourable Henry Martin Doyle of Newcastle, New South Wales, member of the Legislative Council of New South Wales, M.R.C.S. England, L.R.C.P. London, L.S.A. London, youngest son of the late James Doyle of Ballan, Victoria, and of Tombric on the River Slaney, Wexford, Ireland, and nephew of the late Venerable Canon Thomas Doyle of Ramsgrange, Wexford. Born at Ballan, Victoria, 1859. R.I.P.

FULLER.—On March 7th, at Abercorn-place, N.W. Henry Roxburgh Fuller, M.V.O., M.D., late of Curzon-street, W. 1, after a long illness.

KENDALL.—On March 5th, at Chiddingfold, Nicholas Fletcher Kendall, M.R.C.S., L.R.C.P., aged 59.

RIVIERE.—On March 6th, at Queen Anne-street, W. of pneumonia, Clive Riviere, M.D., F.R.C.P., aged 56.

THOMSON.—On March 6th, at Leyborne-park, Kew Gardens, Surrey, Elsie Thomson, M.B., Ch.B. Edin., D.P.H., aged 37 years.

WALKER.—On March 3rd, at Deerfield-road, March, Cambs., James Pixton Walker, M.D., M.R.C.S., L.R.C.P. D.P.H., County Medical Officer, Isle of Ely, aged 63.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Notes, Comments, and Abstracts.

MEDICO-LEGAL DIFFICULTIES IN GENERAL PRACTICE.

AN ADDRESS AND A DISCUSSION.

AT a meeting of the West Kent Medico-Chirurgical Society held on March 8th, Dr. T. E. WHITE, Vice-President, took the chair, and Dr. JAMES NEAL, Secretary of the Medical Defence Union, read a paper on Some of the Medico-Legal Difficulties of General Practice.

During 1928, he said, he had been consulted by over 1400 medical practitioners—which gave some idea of the prevalence of medico-legal problems in the profession. Most of them were preventable; many were due to carelessness or slackness; some to ignorance of the statutes which affected a medical practitioner. The doctor was subject to all the obligations of an ordinary citizen, except jury-service, and even from that he must claim exemption when the lists were revised; if his name appeared on the list he would be liable to serve. In addition, some 50 special statutes imposed duties on the medical practitioner in connexion with his work, and obligations imposed by professional traditions regulated his relations with the public and his colleagues. The General Medical Council was the only authorised body empowered to exercise control over the doctor, and it derived its authority solely from its power to erase a name from the Register. Every practitioner should therefore make himself acquainted with the various pronouncements of the Council.

Obligations of the Registered Medical Practitioner to the State.

Notification of Births.—Too often the practitioner "in attendance upon the mother at or within six hours after the birth of a child," omitted to ascertain whether the father or nurse had given the required notice in writing to the medical officer of health, with the result that—owing to the default of others—he rendered himself liable to a fine. All births after the twenty-eighth week of gestation must be notified, whether the child were born alive or dead. As stillbirths must now be registered, the doctor might be required to certify that the child was not born alive, but this was not a statutory duty and the certificate could be charged for. No charge could be made for notification of birth.

Certification of Death.—The doctor attending a patient in his last illness must sign and deliver to the registrar—either personally or in the official franked envelope by post—a certificate of the cause of death. Notice in writing of the signing of the certificate must be given to the person who would register the death. Even when the doctor desired to refer the facts to a coroner he should not now refuse the statutory certificate, but should indicate on the back thereof that he had reported to the coroner, and the registrar would then suspend registration of death until he learned whether or not the coroner would hold an inquest. The doctor must state on the certificate whether or not he had seen the deceased since death, and the registrar would report to the coroner any case where the deceased had not been seen by the certifying practitioner since death or alive within 14 days before death. No fee could be charged for the statutory certificate, but any additional certificate required by the relatives might be charged for. Any certificate required under the Friendly Societies' Act must be a "certified copy" issued by the registrar and not a duplicate signed by the doctor. The statutory certificate could not be refused on the ground that professional fees were owing.

Inquests.—There was no statute imposing on medical practitioners the duty of notifying a death to the coroner, but the doctor shared with others the common law duty of informing the coroner of any case of sudden or suspicious death. For a post-mortem examination and report ordered by the coroner the practitioner would be paid a fee of two guineas, with an additional guinea if he gave evidence at the inquest. The fee for giving evidence without a post-mortem was one-and-a-half guineas for each day. The doctor should insist on a subpœna for the inquest, as without it he would not be able to enforce his claim for a fee.

Notification of Infectious Disease.—It was the duty of every doctor, on becoming aware that a patient was suffering from a scheduled infectious disease, to send forthwith to the medical officer of health a certificate stating the name of the patient, situation of the building, and the disease. Similar notifications must be sent to the chief inspector of factories in the case of lead, phosphorus, arsenic or mercury poisoning or anthrax contracted in any factory or workshop. It was customary to notify infectious disease by telephone to ensure early removal to hospital, but the statutory written notification should be made at the earliest moment also.

Evidence in Court.—The evidence in court of a medical practitioner was privileged to the extent that no civil action would lie against him in respect of it, but he could not refuse to disclose information obtained in the course of professional relationship. He should appeal to the judge if asked to disclose a confidence, but if the judge directed him to answer he must obey or take the consequences, which might involve committal for contempt of court. The fee for a professional witness in criminal cases was fixed by Home Office regulations. In civil cases the High Court usually allowed from one to five guineas a day with reasonable travelling expenses, but the witness usually arranged professional fees with the solicitors. He should insist on a written undertaking beforehand to pay the agreed amount. It was worth remembering that the only way to avoid the risk of being compelled to attend Court was to avoid being in a position to give evidence on any matter likely to be the subject of legal proceedings. Before giving a report in a case that might lead to litigation it was wise to insist on a written guarantee of fees for the report and for subsequent attendance in Court.

Dangerous Drugs Regulations.—The publication of the Dangerous Drugs (Consolidated) Regulations, 1928, had simplified the complex position relating to dangerous drugs. All doctors were now required to enter in a register true particulars of every quantity of any drug or preparation obtained. Seventeen preparations were specifically exempted, as were also those containing less than one-fifth per cent. of morphine or one-tenth per cent. of cocaine. All strengths of heroin and extracts and tinctures of Indian hemp were now included. A medical practitioner was entitled to prescribe whatever drugs he conscientiously believed to be necessary for the patient, but if he were disposed to order an excessive quantity of a dangerous drug he would be well advised to call in a colleague of repute to assist him in deciding the amount. Administration of morphine or heroin to addicts could only be regarded as legitimate for persons undergoing treatment by gradual withdrawal and for those from whom, after every effort had been made, the drug could not be completely withdrawn. In either case the practitioner should exercise close supervision and share his responsibility with a colleague. Since 1926 special tribunals might investigate the case of a doctor who was believed to be supplying or prescribing the drugs otherwise than in proper medical treatment, and on their recommendation the Home Secretary might withdraw the doctor's authorisation, so that—although still entitled to practise—he would be deprived of a part of his necessary equipment.

Certification.—Medical certification of all kinds bristled with dangers, and scrupulous care should be taken only to certify such facts as were within the personal knowledge of the certifier. Words affecting the character and reputation of the person concerned must not be used. Many certificates were highly confidential and should be handed to the patient only. The diagnosis of an infectious disease might be called in question, but provided the certifying doctor possessed average skill and knowledge and had taken reasonable care, he was not likely to be held liable. A doctor consulted in a case of alleged insanity ought to be protected from the heavy legal costs of defending undeserved attacks or ridiculous accusations. Section 330 of the Lunacy Act, 1890, was clearly intended to afford some measure of protection, but since the case of *Toogood* v. *Wilks* it had been held that the burden of proving negligence did not lie with the plaintiff, but that the doctor must prove that he had acted in good faith and with reasonable care. This particular point, however, had not been made clear by the Court of Appeal in the Harnett case, and where the onus of proof lay was not quite certain. However much it might be possible to strengthen Section 330, there would remain the danger of an action for libel. If the certificate had been given in good faith and with reasonable care this ought not to be possible, for no action would lie if the same statements had been made in the witness-box on oath. At present, however, every certifying doctor had the fear of subsequent litigation in his mind for many years.

The Doctor's Obligations to His Patient.

In every case a medical practitioner was legally bound to employ a reasonable amount of knowledge, skill, and care, and—in the absence of a definite arrangement that he should not be paid—he was entitled to be reasonably remunerated for his services. A doctor was not at the beck and call of anyone who chose to send for him. There was no law to compel a man to attend a patient, but if he once undertook to do so he must not go back, except at his own risk. Even if he were attending a case gratuitously he should only withdraw after giving the patient reasonable opportunity to obtain other medical assistance. The legal relationship between doctor and patient was one of contract, and the contract should be as definite as possible from the

outset, to avoid misunderstanding. When some person other than the patient promised to pay the medical fees, the promise should be given in the presence of a reliable witness or confirmed in writing, and the doctor must be careful in the first place to render his account to the person thus made liable and not to the patient. If the promise were conditional—that the other person would pay if the patient did not—the guarantee must be in writing to render it legal. Parents were liable for the fees of a minor, and the husband was liable for his wife, even when separated, unless she had been guilty of adultery or he had made her a definite allowance to cover the cost of medical attendance. An employer was not usually liable for the fees for his servant unless he had assumed liability by a specific contract. Whoever called in a doctor in an emergency was liable for that particular visit, but not for subsequent ones.

A practitioner had no right to do anything to a patient without his consent, or to a child without the consent of parents or guardians. In emergency he must exercise his discretion. Ideally the surgeon should obtain written authority to use his discretion before operating, or he risked an action for assault. A practitioner should not, without the patient's consent, disclose information obtained in the exercise of his professional duties, but this rule was often very difficult to observe strictly. Chief constables sometimes circularised local doctors asking them to inform the police if they should be called in to a woman recently confined when the child was missing; such circulars should be ignored, for it was not part of a doctor's duties to act as a detective. If a mistress brought her servant to the doctor, he could only examine the girl with her own free consent and could only report to the mistress with the girl's permission. In the absence of conclusive objective evidence of criminal interference the doctor would be wise to regard cases of abortion as natural and to refrain from asking questions or receiving information which would make him an accessory after the fact. Even when convinced that the abortion had been criminal he was under no legal obligation to inform the authorities, but if the patient were likely to die he should as a rule urge her to make a statement which might be used as evidence against the abortionist. A dying declaration need not be in writing, though it should be so if possible, and must be signed by the writer and the patient, and witnessed. The doctor who gave information on the uncorroborated statement of the patient might find himself in serious difficulties. In cases of attempted suicide the main consideration must be the welfare of the patient, and only very rarely should information be given to the police.

No information might be given to a wife or husband without the patient's consent, and the wisest course was to explain the illness fully to the patient and refer inquiries to him. The only exceptions to the rule of professional secrecy were where disclosure was required under an Act of Parliament, as in infectious disease; where it was given in obedience to an order of the Court, and when given to prevent the commission of a crime or grave danger to another, or to safeguard the interests of the patient himself. The doctor must be prepared to justify any departure from the usual rule.

Allegations of Negligence.

However well informed and careful a practitioner might be, he was always at the mercy of any aggrieved person. It was a great temptation to avoid publicity by a small monetary payment, but every case fought and won would help to protect other practitioners from similar claims. Most allegations of negligence were set up as a counter-claim against the payment of fees. If a doctor had exercised due care and ordinary skill he was entitled to be paid; his employment did not imply a contract to cure. Negligence could not be defined; substantially, it meant failure to exercise "reasonable skill and care," and this might include instructions to the nurses and patient for their conduct in the doctor's absence or after his attendance had ceased. Each case must be decided on its merits, and it was rarely possible to appeal against the decision of a jury on a question of fact such as negligence; the bench often displayed a tolerant attitude to the doctor, but it was by no means certain that the jury would do so. It was the easiest thing in the world to trump up a charge against a doctor; almost any line of treatment was open to criticism. The defence depended upon the evidence available to rebut the alleged negligence. The prudent man would therefore adopt precautions as a routine. Detailed examination and elaborate tests were of the greatest value when a case went into court. A stupid error in diagnosis was not likely to lead to disaster if there had been a punctilious observance of all the customary procedures for arriving at a correct diagnosis, but an excusable or almost unavoidable mistake was difficult to defend if there had been an omission of any recognised procedure, however useless in the particular case. Even the most necessary routine examination of a woman might be misconstrued as an indecent assault, and if that risk were carefully avoided the doctor might be charged with incomplete and negligent examination. The peril was no mere bogy. In cases of extreme carelessness or gross ignorance criminal proceedings might be taken against the doctor.

Libel and Slander.—Responsibility of the Surgeon.—Gifts.

Doctors were particularly liable to be prejudiced in their profession by slanderous rumours; it was of paramount importance to get evidence as early as possible and to secure a signed statement from anyone who could testify to the utterance. It was not sufficient to say that "scores of people" had heard the slanders and would be pleased to give evidence when the time came.

In any case of injury to bones or joints the doctor should invariably advise X ray examination, and take some steps to record the fact if the advice were refused. It was generally said that a surgeon was responsible for negligence on the part of his helpers at an operation, but it was very doubtful if he could be held responsible for the acts of, for instance, a fully trained nurse carrying out duties delegated to her, fully within her competency, and which the surgeon could not conceivably supervise while attending to his own work. Apart from midwifery it was extremely indiscreet for a doctor to operate and anæsthetise single-handed; he should never do it on a woman patient. Dr. Neal regarded any sterilising operation—except for pathological conditions—as illegal, and thought that if the patient should die the operator would be in grave danger of conviction for manslaughter.

There must be no possibility of even a suspicion of undue influence on the part of a doctor for his own benefit in the case of gifts and legacies from patient to doctor. Undue influence must be proved in order to invalidate a will and it must be shown that the testator was coerced into doing what he really did not want to do.

Inquiries by Public Health Officers.

Early in 1927 practitioners in four districts had been asked to give information on the health of parents, the character of pregnancy, and any history of tuberculosis, syphilis and rickets, as part of an international inquiry into infant mortality. The Medical Defence Union had been unable to advise compliance with these requests in individual cases, and the form of questionaire had soon been modified, although not so much as to render it unobjectionable. Inquiries had recently been made in connexion with puerperal fever regulations; the objection to these lay in the fear that the information given might prejudice the doctor's legal position in the event of proceedings for alleged negligence. Medical practitioners were under no obligation to furnish any information to the medical officer of health in such cases.

Doctors were frequently liable to a double penalty for a single offence, for any practitioner who had been convicted and punished for a felony or misdemeanour was liable to have his name erased from the Medical Register. The medico-legal dangers of the doctor were by no means imaginary.

Some Points Raised in Discussion.

In reply to various questions put by members of the audience Dr. Neal added the following points:—

In practice it was often inconvenient to post a death certificate to the registrar on account of the delay involved; by law it must either be handed personally or sent in one of the franked envelopes, but the registrar often allowed it to be sent by a messenger—who might be the relative—at the doctor's own risk. If a policeman fetched a doctor for an accident the fee should be recoverable from that individual policeman, but not necessarily from the police force. In some districts the police would always pay; in others they would not. The rule of professional secrecy did not depend upon the severity of the disease. If a contagious syphilitic patient, after full explanation, insisted on marrying, the doctor's action was a matter for his individual conscience. If a mother brought her daughter whom she suspected of being pregnant, the doctor should insist that the daughter tell her mother rather than tell her himself. A doctor who contracted an infectious disease in the course of his employment by a public body could only have a claim against that body either under the Workmen's Compensation Act—the total allowance being then 30*s.* a week—or under common law. Unless there were negligence on the part of the authority he would have no redress. To tell a nurse attending a patient that the latter had, for instance, syphilis, and warn her to be careful, would be a privileged communication and certainly necessary in the interests of the nurse. A hospital was not likely to be liable for the actions of its medical officers if due discretion and care had been exercised in their selection. The guardians would usually pay the expenses of a poor-law medical officer sued for wrongful certification under the Lunacy Act, though not perhaps his damages, if awarded.

There was no doubt that a surgeon would not be held responsible for negligence on the part of the anæsthetist. A remark in the doctor's notes: "X ray advised and refused" would certainly be a valuable defence, especially when the absence of an X ray picture was the only point where negligence was alleged.

THE HEALTH OF PALESTINE AND TRANS-JORDANIA.

A REPORT, signed by Field-Marshal Lord Plumer, the High Commissioner, was recently presented by H.M. Government to the Council of the League of Nations on the administration of Palestine and Trans-Jordania for the year 1927.

Epidemic Disease.

Palestine was comparatively free from epidemics of the more serious diseases. There were 1001 cases of enteric with 76 deaths; the incidence was high in Jerusalem, but much reduced in Haifa, Tel-Aviv, and the Jewish settlements in the Valley of Esdraelon, where inoculation, practised after the serious outbreaks of 1926, gave a large percentage of immunity. Dysentery was more prevalent, with 1782 cases, 31 fatal. Neither plague nor cholera occurred. There was a single case of small-pox in Jerusalem, imported from Damascus; 34,000 inhabitants of Jerusalem underwent vaccination in consequence; the total of vaccinations during the year reached 81,893. There were 3305 cases of measles, a source of considerable infant mortality; 324 deaths resulted. Eighty-three cases of typhus occurred, with one death, in villages where the disease is endemic. Urban scavenging services were generally well maintained and not a few improvements in organisation and in refuse disposal introduced. The improvement in the sanitation of shops and houses was marked in old quarters as well as in new suburbs. A little progress was made in improving the sanitary conditions in the settlements attacked by enteric fever.

Vital Statistics.

The birth-rate was slightly less than in 1926 and the death-rate and infantile mortality increased. There were 3186 more deaths than in 1926, including 2620 of children under 5 and 450 of persons over 50 years. This increase was evenly distributed among Moslems, Jews, and Christians, and is not attributable to infectious disease. For the quinquennial period, 1923–27, the birth- and death-rates per 1000 were as follows:—

	Birth-rate.	Death-rate.	Estimated population.
1923	47·43	25·67	662,013
1924	51·31	25·94	681,245
1925	49·31	27·25	719,508
1926	53·47	24·43	761,896
1927	50·35	28·01	778,369

(NOTE.—No figures, either in this table or the one below, are included for the nomadic Bedouin population, estimated at 103,000.)

The following is a comparative table of births and deaths by religions for the year 1927:—

	Christians.	Moslems.	Jews.	Others.	Totals.
Population ..	76,839 ..	545,225 ..	147,687 ..	8,618 ..	778,369
Deaths	1,545 ..	18,031 ..	1,987 ..	243 ..	21,806
Death-rate per 1000 ..	20·10 ..	33·07 ..	13·45 ..	28·19 ..	28·01
Births	2,991 ..	30,586 ..	5,182 ..	434 ..	39,193
Birth-rate per 1000 ..	38·92 ..	56·09 ..	35·08 ..	50·35 ..	50·35
Deaths of infants under 1 year	560 ..	6,631 ..	598 ..	68 ..	7,857
Infantile mortality-rate ..	187·22 ..	216·79 ..	115·79 ..	153·68 ..	200·46

Personnel.

Twenty-six pupil midwives and 11 midwives with foreign qualifications were licensed, bringing the number of trained and licensed midwives up to 221. Yet midwives are reluctant to settle in the villages to practise among the peasantry where their attendance is a crying need. There are now 561 doctors, 160 pharmacists, and 183 dentists licensed in Palestine. At the end of the year there were 28 child welfare centres—17 Jewish, 7 Government and municipal, and 4 conducted for Arab children.

Leprosy. Malaria.

Twenty-four lepers, who are not in-patients at the Moravian Mission Home in Jerusalem, receive out-patient treatment at the Government dispensaries. A British specialist surgeon has been appointed to the staff of the Department of Health. Improvements at the Jaffa Lazaret are in progress; it is being adapted to receive infectious cases in the event of a large epidemic. The Haifa Lazaret was remodelled and re-equipped to provide good accommodation for 500 persons. 601 Palestinians made the pilgrimage to Mecca. Foreign pilgrims, Persians, "Iraqis," and Indians show an increasing tendency to return by way of Palestine and so overland to Iraq. The cholera epidemic in Iraq necessitated special precautionary measures on the Palestine and Trans-Jordan frontiers, which the rapidly developing trans-desert route from Iraq to Syria and Palestine renders more liable to infection. There was rather more malaria on the whole than in 1926, and during the autumn several sharp but localised outbreaks occurred in the Jordan Valley and other infected regions. An important scheme for draining the malarious Kishon swamps near Haifa at a cost of £P22,000 has begun. The Palestine Jewish Colonisation Association continued work on the drainage of the Kabbara marshes. Malaria control measures over a large area round the Palestine Electric Corporation's camp near the confluence of the Jordan and Yarmuk were carried through by Government agency.

Hospitals.

The Government are contributing some 30 per cent. of the cost of a new hospital in Tel-Aviv, and will guarantee payment of an annual contribution by the Tel-Aviv township towards its maintenance on condition that a certain number of beds is set aside for the treatment of local cases of minor infectious diseases. Two new motor-ambulances have been obtained for the Department of Health; police in each district were instructed in first-aid, and police-stations re-equipped with first-aid materials.

Over 100,000 routine bacteriological and chemical investigations were carried out. The bacteriological subsection of the Government laboratories has produced all prophylactic and curative vaccines required by Palestine and Trans-Jordan as follows: Small-pox, 180,000; plague, 1500; typhoid, 32,600; T.A.B., 38,650; cholera, 60,800; antirabic, 71,585 (1008 treatments). The chemical subsection devoted itself to the analysis of edible oils and fats.

Trans-Jordania.

During the year the following cases of infectious diseases occurred: Of enteric fever, 66 with 6 deaths; of influenza, 34 with 6 deaths; of dysentery, 66 with 2 deaths; of whooping-cough, 31; of measles, 154 with 30 deaths; of mumps, 154; of chicken-pox, 12; of pneumonia, 37 with 7 deaths; of puerperal fever, 4; and of erysipelas, 14 cases with 1 death. There were single cases of small-pox (imported) and diphtheria. The steps taken to protect water-supplies from contamination have noticeably reduced the incidence of enteric and dysentery. The control of malaria throughout Trans-Jordania is well in hand. Special campaigns were organised in the fertile but hitherto infected areas along the south-eastern shores of the Dead Sea, where 88,000 metres of canal and stream were cleared and rendered innocuous. The Italian National Association opened a hospital at Amman with 28 beds. The Church Missionary Society's hospital at Es Salt receives an annual grant of £E240 from Government. The Department of Health has now a laboratory section in charge of a qualified bacteriologist.

BIFOCALS FOR GOLFERS.

UNDER this heading there is a letter in the *Optician* for Feb. 1st in which the writer relates that he was one day playing golf with an opponent who was wearing bifocal spectacles and inquired how he managed to see the ball. "His reply was unexpected. He said he had improved his game at least six strokes a round because the bifocals made him keep his head low." As is well known among golfers one of the most distressing maladies to which they are subject, with which the mere will is often powerless to grapple, is that of "looking up." What actually happens is that at the moment of striking the ball our heads go up while our eyes are still looking down. The suggestion is that if we cannot see the ball clearly through the lower part of our spectacle glasses that will serve as a reminder to us not to move our heads up at the critical moment, with the result of "topping" the ball. The story is one over which medical golfers might do well to ponder, and perhaps to test by experiment.

CLAYTON HOSPITAL, WAKEFIELD.—Miss Elizabeth Childs last week cut the first sod in preparation for the building of the new women's wards at this hospital, the cost of which, approximately £30,000, is being borne by her cousin, Mr. Samuel Childs, of Camden, New Jersey, a native of Wakefield. The new wing will adjoin the out-patients' department, which was recently built and equipped by Mr. Childs. It will comprise two women's wards with 48 beds and a small private ward for paying patients, and will be a complete unit with its own operating theatre.

Lumleian Lectures

ENTITLED

A MEDICAL REVIEW OF THE SURGERY OF THE CHEST.

Delivered before the Royal College of Physicians of London

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LECTURE I.

Delivered on March 19th, 1929.

MR. PRESIDENT, CENSORS, AND FELLOWS OF THE COLLEGE,—Curiosity, stimulated by the search for a subject, and by a brief reference in the College List to Holinshed's "Chronicles,"[1] impelled me to delve a little into the early history of the Lumleian lectures. I found that they were the joint foundation of Dr. Richard Caldwell and the Lord Lumley, and were endowed by each equally. Though initiated in 1581, the first series were not given until 1582, when Dr. Richard Forster[2] was appointed lecturer, a post he filled until 1602. The immortal Harvey was appointed lecturer in 1615 and held the post for 41 years. It was through the medium of these lectures that he first published his views on the circulation.

There can be little doubt that the relations between Lord Lumley and Dr. Caldwell were those of professional attendance and friendship, and that the zeal of the latter for the advancement of his profession, backed by his own generosity, stimulated Lord Lumley to a like enthusiasm and practical sympathy. Lord Lumley was a learned man and a member of the Elizabethan Society of Antiquaries. His library was bought by King James I. and eventually given to the British Museum by King George III. He seems to have sympathised with Mary, Queen of Scots, and he languished in the Tower in 1569 and in the Marshalsea in 1571.[3] Though he died on Tower Hill, he was fortunate enough to do so in his own house and with his head on his shoulders, instead of in the adjacent execution ground. His father was both attainted and executed, and the peerage was a restoration to the status of his grandfather.

Dr. Caldwell is referred to in Holinshed as the "English Hippocrates and Galen." He was admitted a Fellow of this College in 1559 and made a censor the same day. He was afterwards President in 1570. It would seem that Caldwell was specially interested in surgery. His one published book, a posthumous publication, was a translation of some "Tables of Surgerie" by Horatius Morus, a Florentine physician. His tomb "at St. Benet's by Paule's Wharf" was adorned with surgical instruments and other appropriate devices. A further evidence of this interest is the explicit direction that these lectures were to be on surgery "for the common benefit of London and consequentlie of all England." It is stated that "before the foundation of these lectures there have been lectures on physic, though chiefly at the universities, that the needfulness of similar instruction in surgery is apparent, as hitherto hath been the want and lack so hurtful." It is also claimed that "the like thereof is not established nor used in any Universitie of Christendom (Bononie and Padua excepted), and therefore it is the more to be esteemed." It is recommended that they are to deal "onlie of surgerie and not of physicke." It further says "that part which onlie useth the hand, as it is sorted from the apothecarie." Caldwell also hoped that these lectures would be to the "common profit of Her Majestie's subjects and good fame, with increase and credit of all the surgians of this Realme." He was evidently both progressive and practical, for he directs that the lecturer shall "read for ¾ hour in Latine, and the other quarter in English, wherein shall be plainlie declared for those that understand not Latine, what was said in Latine." He was also "to dissect openly all the bodie of a man, especiallie the inward parts, for five days together, as well before as after dinner, if the body may so last without annoie."

The College evidently esteemed the gift highly, as it set aside £100, the major part of its reserve, to enlarge the College buildings, then consisting of the house devised to them by will of Dr. Linacre. It comes as a disappointment to learn that there is a note on July 17th, 1584, in the College records of the want of attendance at these chirurgical lectures.

This short incursion into historical matters is my apologia for my choice of subject. I feel that in presenting a Medical Review of the Surgery of the Chest, though I am departing from long-established precedent, I may yet conform in some small degree to the wishes of the pious and enlightened founders.

THE SURGERY OF THE CHEST.

Boundary or border areas are usually the scene of strife and conflict where countries or policies are concerned, and the subject of argument or polemics where ideas, ideals, or methods impinge on one another. The boundary zone of surgery and medicine is no exception. There is something fundamentally different in medicine and surgery. Medicine is in the main abstract, dealing with deranged organs and with disturbed functions. Surgery is in its essence concrete and mechanical, and is concerned in removal, adjustment, and adaptation.

There would be few to dispute that some of the greatest triumphs of surgery are in the failures of medicine, but, on the other hand, some of the greatest surgical tragedies occur where surgery has been ill-advisedly or unsuccessfully invoked in medical conditions. This is most emphatically true in regard to the surgery of the chest. If this branch of surgery is to advance, and I believe it to have a great and beneficent future before it, it must advance along right lines. There must be the closest, the most understanding and sympathetic coöperation between the physician and the surgeon. There must be a close conformity to the conditions existing between the neurologist and the specialist nerve surgeon, rather than to the conditions which unfortunately occur too often in regard to the surgery of the stomach and duodenum, in which some too enthusiastic surgeons have come to regard surgery as a primary means of treatment, which it is not.

Surgery can afford the most dramatic assistance to the physician in cases of disease of the lungs, bronchi, mediastinum, and pleura in cases otherwise grave or even hopeless. What is needed is a better understanding on the part of the physician and of the general practitioner of what surgery can do and perhaps even more of what it cannot yet achieve. Ill-informed opposition and too enthusiastic recommendation are alike to be avoided. In no branch of our science is efficient and adequately coördinated "team-work" more essential, but the physician should in the end be the predominant partner, or at any rate have the casting vote. The surgeon should be his co-adjutor and his agent, but certainly not his substitute. It is true that many surgeons who have specialised in thoracic surgery have been accomplished and skilled students of physical signs and of diagnosis. The late Sir Rickman Godlee was a first-rate observer, even with the stethoscope, as well as an accomplished surgeon, while I can testify that the present-day thoracic surgeon has often a knowledge of the medical aspects of thoracic disease which many physicians might envy. It is equally true to say a physician concerned with chest diseases should have a knowledge of surgical principles and technique at least sufficient to enable him to appraise the chances of success of the procedures he recommends.

This naturally raises the question whether in the future, if specialisation advances to its logical development, the diagnosis and treatment may not eventually be concentrated in one person. There is some precedent

for this, since Saugman, who helped on the progress of surgery as applied to pulmonary tuberculosis, did his own thoracoplasties. Brauer now carries out his own operations, and Gravesen, Saugman's successor at Vejlefjord Sanatorium, is both physician and surgeon to the patients under his care. I have an open mind on this subject, but I feel that at present the ideal arrangement is an understanding and critical coöperation between physician and expert surgeon. I like to discuss my cases with my surgical colleagues, and welcome criticism and alternative suggestions.

The team in regard to successful surgery in chest diseases involves more than the physician and the surgeon. The radiologist plays an increasingly important rôle, the bacteriologist, hæmatologist, physiologist, or biochemist may contribute crucial information, or even veto the appeal to surgery. Lastly, the anæsthetist is contributing greatly to the success of chest operations. The advances in his art have rendered the major operations possible and have eliminated many dangers. In this connexion it is not too much to say that the organisation of the surgeon's operative team is a most important factor in successful operation. The anæsthetist, the assistant, the sister and the nurses combine to form a coördinated mechanism which compels admiration, and which economises time and effort.

As I shall show later, time and the avoidance of shock are factors of vital importance to the patient. An operation like thoracoplasty demands great energy, concentration, and judgment, especially in regard to the extent of rib removal. In expert hands it is an admirable operation, in the hands of the tyro it is apt to be a shambles. It is for these reasons that it is to be hoped that, at any rate for the present, the more difficult and special operations will only be attempted by surgeons experienced in this work.

The early history of thoracic surgery in this country is in some senses a record of misfortune and of tragedy. The fundamental ideas and some of the earliest achievements stand to the credit of British observers. The essential and fundamental idea of collapse of the lung as the basis of treatment of many pulmonary conditions dates from Dr. Carson's [4] brilliant suggestions in 1820. He foresaw the benefit likely to result from collapse of the diseased lung induced by pneumothorax. In both cases in which he had attempts made to carry this out by open incision adhesions were present at the site and no pneumothorax was obtained.

Cayley,[5] in 1885, had an open pneumothorax induced by Pearce Gould to try to arrest severe hæmoptysis. Although the operation appears to have been effective in stopping the hæmorrhage, the patient died shortly afterwards from extension of the disease.

Cavities were drained as long ago as 1844 in this country by Dr. John Hastings and Mr. Storks.[6] Dr. Shingleton Smith injected medicaments into pulmonary cavities in 1885. Lowson [7] removed diseased portions of tuberculous lung in 1893, and Sir William Macewen [8] in 1895 removed the left lung for advanced tuberculous disease, probably with pyopneumothorax, the patient being alive 18 years afterwards. It was a misfortune that these successes were, as it were, accidental, and rather diverted attention from the more rational methods advocated by Carson, and now so fully established. Sir Rickman Godlee did most valuable work at the Brompton Hospital, and the thoracic surgery he carried out was sound and practical. The pioneer of the modern applications of chest surgery in this country is Mr. Morriston Davies,[9] who began to carry out special chest operations as early as February, 1913. His writings and his operative work are notable and stimulating contributions to the subject. His departure from London to a more restricted field of activity was a great misfortune, though he continues to do excellent special chest surgery in Wales.

The preoccupations of the years of the Great War doubtless further hindered the progress of chest surgery in this country, although owing to the coöperation of physicians, surgeons, and bacteriologists in the investigation of wounds of the chest, the treatment of these and of the conditions consequent upon them, such as hæmothorax and empyema, was stabilised and greatly improved. A further advance was the general recognition of the safety under ordinary precautions of thoracotomy. In these important developments, Sir John Rose Bradford, Prof. T. R. Elliott,[10] Dr. William Pasteur, Sir Wilmot Herringham, Dr. A. B. Soltau on the medical side, with Sir Berkeley Moynihan, Sir Henry M. W. Gray, and Prof. G. E. Gask on the surgical side, all played a notable part.

At the present time the rôle of surgery in chest disease is becoming more widely recognised and the special chest hospitals in London have developed arrangements to deal with the demand. At the Brompton Hospital a special surgical department, admirably equipped, is now in full working order in the charge of Mr. J. E. H. Roberts and Mr. A. Tudor Edwards. The results already obtained are more than encouraging. My colleagues and I find the assistance of our surgical colleagues increasingly necessary, as the indications for surgery become more clearly defined and the results more convincing. Similar work is being done at Victoria Park Chest Hospital by Mr. W. H. C. Romanis and Mr. R. H. O. B. Robinson.

The reasons why the surgery of the chest and especially that of the lung and mediastinum has developed later than other special applications of surgery are in the main: (1) The difficulty of access, owing to the bony thoracic cage with its serous lining. (2) The fear of open pneumothorax with the resulting collapse of the lung and sometimes rapid death. (3) The difficulty in collapsing cavities. (4) The risk of mediastinal flutter. (5) The occurrence of cerebral abscess and septic meningitis after empyema, bronchiectasis, and pulmonary abscess, first noted by Sir William Gull [11] in 1857. There is no reason to think that operation promotes these conditions, indeed we may hope that surgery will diminish their incidence. (6) The fear of gas embolism and of pleural shock or reflex. Both of these conditions are now rare with present-day methods.

Modern thoracic surgery dates from the last few years of the nineteenth century. Since that time its progress has been remarkable and the literature of the subject is now enormous. Modern developments in thoracic surgery have been rendered possible by: (1) A more accurate appreciation of the mechanics of respiration, including the intrapleural and intrapulmonary pressures, and of the part played by the mediastinum in thoracic physics. (2) Improved methods of diagnosis. (3) Modern developments in anæsthesia both local, regional, and general. (4) Rigorous selection of cases and careful preparation. (5) Improvements in technique, resulting in saving of time and avoidance or lessening of shock, with careful nursing, dressing, and after-treatment.

These factors may with advantage be considered categorically in some detail.

Respiratory Physics.

After the earliest inspirations of post-fœtal life the lungs are expanded, the alveoli become opened out by air, and the elastic tissue stretched, resulting after about four days in a constant tendency for the lungs to retract from the chest wall, which is expressed in a negative or subatmospheric pressure. The figures for these pressures, given by Donders, are those usually quoted—viz., −6 mm. of Hg at rest or in the cadaver, −7·5 mm. Hg at end of expiration, −9 mm. Hg at end of ordinary inspiration. At the end of deep inspiration it can reach −30 mm. Donders [12] is stated to be the first to have made these measurements in man in 1853, but Carson in 1820 recognised this elastic tension and its significance in regard to respiration and in promoting the circulation. Aron,[13] in 1902, made some actual measurements with a glycerine manometer on a normal,

healthy person, and obtained as a mean of 36 observations at the height of normal quiet inspiration −4·64 mm. Hg. and at the height of quiet expiration −3·02. At rest the intrapulmonary and intrabronchial pressure is naturally that of the atmosphere. It is 2 or 3 mm. Hg below this during quiet inspiration and an equal amount above it during ordinary expiration. In forced inspiration it may reach a negative pressure of −57 mm. Hg, and in forced expiration a positive pressure of 87 mm. Hg or even higher when breathing into and out of a closed space or against a mercury manometer. The pressure attained with forced expiration with closed glottis as in cough is therefore considerable.

It is important to remember in this connexion that the respiratory functions can be effectively carried out when the external pressure is below or above the ordinary atmospheric pressure, and this fact is utilised in some of the modern methods of administering anæsthetics. It must be borne in mind also that so long as the chest wall is intact the intrapleural pressure is always less than the intrapulmonary by just so much as corresponds to the degree of stretching of the lung tissue.

From the standpoint of thoracic medicine and surgery, the alterations induced in the pressure relations by gas and effusion in the pleural cavity, or by growths in the bronchi and mediastinum, are of fundamental importance. The history of our knowledge of pneumothorax up to 1903 has been exhaustively studied by Emerson.[14] Itard,[15] in his Paris thesis of 1803, first applied the convenient name of pneumothorax to the condition of gas in the pleural space, and he has often on this account been regarded as the discoverer of the condition. Emerson's historical survey has, however, established that Boerhaave, Meckel, and others had observed the presence of gas in the pleura. Hewson,[16] in 1767, clearly recognised the condition, and even suggested paracentesis thoracis to let air out of the chest. His teacher, Alexander Monro the younger, of Edinburgh, claimed priority for this idea, made in his lectures in 1761–62, and Hewson later admitted that he may have heard Monro make this suggestion. Hewson also observed that in gunshot wounds of the chest, the difficulty of breathing, which was often extreme when the wound was open, became greatly relieved when it was closed, an observation which the modern thoracic surgeon has often confirmed. It is interesting to note that in the fourteenth century Henri de Mondeville[17] advised the closure of penetrating chest wounds.

From the time of Itard pneumothorax became the subject of very numerous observations on the part of clinicians and pathologists. Laënnec was almost certainly the first to diagnose the condition during life, and with characteristic thoroughness gave an account of the signs, to which little has been added, save that he does not seem to have observed the displacement of the heart, which so commonly occurs. This was apparently first recorded by M. A. Gaide in 1828, though he states that Laënnec had seen it once.

Important contributions to the study of pneumothorax were made by our former President, Sir Richard Douglas Powell[18] in 1868 and 1869. He first pointed out that the heart and mediastinum are maintained in position by the balanced opposing negative pressures of the two pleural spaces, and that in pneumothorax the displacement is due to the unbalanced or unopposed traction by the sound side, and not to pressure; moreover, he was apparently the first to recognise that in valvular pneumothorax a definite positive pressure could occur, causing further displacement of the heart and mediastinum and increasing the embarrassment of respiration and circulation, sometimes to a dangerous or even fatal degree. His observations paved the way for the general adoption of the simplest form of thoracic decompression by insertion of a trocar into an intercostal space, and he recommended this to be done, although J. Davy in 1823[19] and James Johnson in 1829[20] had both demonstrated the valvular nature of the opening in cases of pneumothorax and both withdrawn gas by puncture, giving relief to the patients. This simple procedure often gives rapid and dramatic relief and has no doubt saved many lives. It is now generally performed by reversing a pneumothorax apparatus, so that the amount of gas withdrawn can be measured, and the pressures at the beginning recorded and those at the end of the operation controlled.

The classification of pneumothorax into open, closed, and valvular varieties appears to have been made first by Unverricht[21] in 1879, though Weil arrived at a similar classification in the same year on experimental grounds. This classification is still current and is useful.

In closed pneumothorax, whether the original opening be in the parietal or the visceral pleura, the gas quickly takes on the composition of alveolar air by diffusion, and is rapidly absorbed, unless the pleura becomes infected. It is for this reason that in therapeutic pneumothorax spaced refills become necessary. It is interesting in this connexion to note that as time goes on the pleura becomes less absorbent of the air, so that longer spacing is possible. In valvular pneumothorax the condition of the patient becomes rapidly grave, unless relief is given by paracentesis, as has just been described.

In open pneumothorax, when the opening is in the visceral pleura, the lung is collapsed and the intrapleural pressure on that side varies with the intrapulmonary, being practically atmospheric. The heart and mediastinum are displaced to the sound side unless prevented from moving by adhesions. In open pneumothorax with an external wound the conditions are less constant, and there is even at the present time some controversy both as to the actual facts and as to the explanations of the varying conditions observed. It is generally admitted that with a large unilateral external opening rapid and extensive, even complete, collapse of the lung occurs. Great distress and rapid death may result.

The explanation of the grave effects of widely open pneumothorax was supplied by Murphy in 1898.[22] He pointed out that with a free external opening into one pleura the lung in that pleura collapses during inspiration, but expands on expiration. The mediastinum and its contents are displaced by traction to the sound side during inspiration, with the result that adequate ventilation of that side is impeded. On expiration the mediastinal septum bulges towards the side of the open pleura and air is drawn into the collapsed lung. This to and fro movement of the mediastinal septum and its contents is now known as "mediastinal flutter." It is one of the conditions which has to be prevented in operations upon the thorax involving extensive removal of the chest wall, or wide opening of the pleura. Brauer suggested as a further cause of the increasing cyanosis and dyspnœa in these conditions that during expiration air from the sound lung was forced into the collapsed lung and during inspiration it was drawn back into the sound lung—becoming thus increasingly impure—a condition to which he gave the name of "pendulluft." Other factors in the bad effects of a widely open pneumothorax are the embarrassment of the heart, due to the flapping mediastinum, the disturbance of the pulmonary circulation induced by collapse of the lung, leading to a rise of systemic venous pressure as shown by Sauerbruch. The rapid loss of heat, also demonstrated by Sauerbruch, which is much greater than that caused by opening the abdominal cavity to an equivalent extent, is also a factor to be remembered.

It has long been known that these alarming effects of a suddenly developed open pneumothorax can easily be alleviated. Hewson as long ago as 1767 showed that blocking or closure of the opening rapidly lessened the dyspnœa. Sir William Macewen in his Cavendish lecture in 1906 advised turning the patient so that the opening of the pleura occupies the lowest position in the thorax. Closure of sucking thoracic wounds was early recommended in the surgery of the

recent war. Seizing the collapsed lung with forceps and bringing it towards the wound gives rapid relief. This is described in a dramatic account of a case of operation for sarcoma of the ribs by W. Müller [23] in 1893. An accidental hole was made in the pleura and the tumour sank into the pleural cavity. The lung at once collapsed and the patient appeared almost moribund. On pulling up the lung it filled with air and the grave symptoms disappeared. Other ways of preventing these symptoms are by the modern methods of anæsthesia with positive intratracheal pressure. Murphy showed in an interesting manner how little increase of pressure in the trachea was necessary to cause the collapsed lung to expand, and even to protrude through the opening in the chest wall, thus explaining why hernia of the lung instead of collapse can sometimes occur in chest wounds.

So far there is general agreement as to the effects of open pneumothorax. We can now consider some controversial matters. It is often stated that a small external opening can be made into the pleura without collapse occurring. To account for this a cohesive force analogous to capillarity was assumed and was strongly urged by Dr. Samuel West [24] on the basis of some experiments he made. Sir William Macewen accepted this explanation. More recent observations fail to substantiate this. Northrup,[25] in 1890, found experimentally in animals that collapse occurred even with a pinhole perforation. Emerson also brought forward experimental evidence against this cohesive force. Murphy, from the standpoint of the surgeon, stated in 1898 that he had never found the lung in contact even after a pinhole perforation. It is probable, therefore, that where collapse does not occur at once local or adjacent adhesions are the factors preventing the collapse. It is obvious that pleural adhesion, or thickening, rigidity, and adhesion of the mediastinal tissues must greatly influence the effects of external openings into the pleural space. The frequency of these adhesions in disease no doubt accounts for the fact that in the past, even before tracheal insufflation methods of anæsthesia, surgeons have been able to carry out extensive operations involving opening of the pleura, empyema operations especially.

Evarts A. Graham,[26] whose wide operative experience and carefully devised experiments invest his opinions with great weight, stresses the importance of regarding the mediastinum as a yielding rather than as a rigid partition, and therefore alteration of the intrapleural pressure relations on the opened side must produce changes on the opposite or normal side. In some animals, such as the dog, the mediastinal pleura is so thin that it frequently perforates when air is introduced into one pleura, and a double pneumothorax results. This has occasionally occurred in man. Duval [27] and Matas [28] at one time both suggested that there was a communication between the two pleural cavities in the dog—a view they have now abandoned. Even in man there are two relatively weak or unsupported areas in the mediastinal septum—viz., an upper one in front between the first to the third ribs, where the two pleuræ are in close apposition; the lower one is behind between the fifth and tenth dorsal vertebræ.

The former of these is of some importance since in cases of artificial pneumothorax treatment, unless the pressures used are carefully controlled, a bulge or hernia of the mediastinum may occur from the treated to the sound side. Brauer has recorded one case affecting the second of these weaker spots.

Graham maintains that in open pneumothorax the "vital capacity" plays a very important part. It is obvious that with an opening in the chest wall the open pleura and the sound lung compete for the air drawn in by the respiratory movements. If the pleural opening is so wide or the vital capacity so much reduced that the inspiratory input into the lung is below the normal tidal air requirements, death must result from asphyxia. Graham has worked out a mathematical equation by which, if the vital capacity is known, the size of the maximum pleural opening consistent with life can be calculated. Duval has criticised these views and does not associate the size of the opening with the risk of fatal asphyxia. He even advocates a large pleural incision, provided that measures are taken to ensure complete collapse of the lung. The discussion is rather of academic than of practical interest since the introduction of intratracheal methods of administering anæsthetics, but on the whole the balance of evidence seems in favour of Graham's views. The size of opening is also of special interest in regard to bilateral pneumothorax. That life was possible when both pleural cavities were opened by small punctures was demonstrated by Cruveilhier in 1836, and this has been repeatedly confirmed since.

The determination of "vital capacity" seems likely to become a matter of increasing importance in regard to operative procedures on the thoracic organs. The vital capacity is defined as the amount of air which can be expired by the deepest possible expiration after the deepest possible inspiration. The "tidal air" is usually from 500–600 c.cm., while the "vital capacity" varies from 4000–5000 c.cm. in male, 2500–4000 in woman, or more in people of large build or athletic habits. Many papers have been published on this subject, notably by Peabody and Wentworth,[29] Dreyer [30] and Yates.[31] There is a marked lowering of the vital capacity in various pleural conditions, in pulmonary tuberculosis, and in cardiac conditions.

Meltzer has pointed out the great, indeed almost prodigal, reserve afforded by Nature in regard to most vital organs. Life can be maintained by one-sixth, possibly by one-eleventh of the total lung area. The ratio of the normal vital capacity to the tidal air which may be regarded as the ultimate minimum of respiratory ventilation, is a striking example. Graham's contention is that in disease, if vital capacity becomes reduced to somewhere near the level of the tidal air, any further reduction becomes dangerous or fatal. He believes that some of the serious symptoms in therapeutic pneumothorax may be due to too much pressure reducing the vital capacity to a serious or fatal level. Determination of vital capacity may clearly be an important or even a crucial factor in negativing surgical treatment.

Improved Methods of Diagnosis.

It is a singular and an arresting fact that the incursions of surgery into the various departments of medicine have almost invariably resulted in improvements and even refinements in diagnosis, and not infrequently in advances in strictly medical forms of treatment. The surgeon demands as great accuracy as possible in topographical diagnosis, and he usually requires also an assessment of the degree of functional impairment of the diseased organ. At any rate, in regard to any vital or essential organ he needs to know if the mechanical measures he employs, whether removal, displacement or compression, will leave sufficient normally acting tissue to maintain life, with some reserve in case of special demands. Before calling in surgical aid, it is therefore the duty of the physician to investigate his cases in such a way that he may be able to answer as fully as possible the questions the surgeon may ask. It is true that the ultimate and final investigation may involve exploratory surgical procedures, but in the first instance the responsibility of initiating surgical treatment depends, and should always depend, upon the physician. The responsibility for the ultimate procedures adopted must, however, be shared by the surgeon as well as the physician.

Diseased conditions within the chest, especially in conditions deep at the base, at the roots, or in the mediastinum, may afford some of the most difficult problems in medical diagnosis. After the most careful study of the history, the symptoms and the physical signs, it not infrequently happens that only a tentative diagnosis can be arrived at, or a choice of several. It is fortunate therefore that the developments of laboratory and instrumental methods have yielded aid as great as, if indeed not greater than, in the

case of disease of other systems. It is necessary to emphasise, however, that as a matter of routine, the most careful study of the clinical features of the case should be made before the appeal to these special means of diagnosis, in order to obviate misinterpretation, because such methods by themselves may be as equivocal in their indications as clinical investigation alone. It is also desirable to spare the patient avoidable disturbance and unnecessary expense.

The chief special methods available are: (1) radiological; (2) bronchoscopic; (3) thoracoscopic; (4) clinical laboratory methods, including physical, chemical, histological, and bacteriological investigations.

Radiological Methods.

It would be difficult to exaggerate the value of the assistance given by X ray methods in the investigation of chest disease, particularly since the introduction of the method employing the tube at a distance of 4–6 feet to avoid distortion. Stereoscopic radiograms are also sometimes of great value in establishing the depth of the abnormal condition seen, and its position relative to other structures. For mediastinal conditions, oblique views may afford great assistance, while especially in regard to abscess, bronchiectasis and growth, a true or "dead" lateral view may give information of crucial diagnostic importance and be of more value than stereoscopic methods. The lordotic position is also helpful for bringing mediastinal interlobar effusions into view. It is not too much to say that artificial pneumothorax treatment should not be undertaken, except in emergency induction for hæmoptysis, unless full radiological investigation has been carried out, and unless the progress of treatment can be controlled by re-examination from time to time. Thoracoplasty without preliminary X ray examination is never justifiable in these days. Great as have been the gifts of radiology to the advancement of diagnosis and treatment in chest diseases, they have been notably increased by the use of lipiodol as employed by Sicard and Forestier [32] since 1922. Its special value is that it enables the bronchi to be mapped out with accuracy to their finest ramifications. Lipiodol is a special preparation of iodine and poppy-seed oil. It is not irritating, though it contains 40 per cent. of iodine, and as a rule it does not lead to the ordinary symptoms of iodism, except in persons hypersensitive to it, unless it reaches the alimentary tract. Every precaution should therefore be taken to avoid this mischance. Its use is now so general as to be almost a routine in cases of bronchiectasis and chronic abscess. Full details of the various methods of administration and of its use in diagnosis are given in the admirable little book recently published by Dr. F. G. Chandler and Dr. W. Burton Wood.[33] Amounts varying from 5–40 c.cm. are used, usually by injection through the crico-thyroid membrane or between two rings of the trachea. Ballon and Ballon, and Singer,[34] also give useful practical descriptions. The skin is first anæsthetised with novocaine, and the same substance is slowly injected into the trachea. Preliminary tests as to undue sensitiveness to novocaine and iodine should usually be made. The lipiodol, warmed to 100° F., is injected in a special syringe, after it is made certain that the nozzle of the needle is in the trachea and after the position of the patient has been adjusted so that the lipiodol can reach the side selected by gravity. Every effort should be made by the patient to avoid coughing before the films are taken, as the lipiodol may spread widely into the alveoli and the value of the resulting films be diminished or even vitiated. Incidentally such films, taken after cough, suggest clearly how in disease, infected material may be spread widely throughout the lung by cough. Other methods of introducing lipiodol are through the glottis with the aid of a laryngoscope, by injection through a bronchoscope, a catheter, or an intubation tube, and by an oral method described by Singer,[34] in which with the tongue held forward, lipiodol is injected over the base of the tongue and allowed to flow into the larynx. The indications, contra-indications, and dangers are clearly summarised by Chandler and Wood. From my own experience I have found it of the greatest value in confirming and establishing the diagnosis of bronchiectasis, in determining whether this condition is localised or bilateral, and in distinguishing between it and abscess, a matter of great difficulty in many cases. In abscess, lipiodol as a rule does not enter the cavity, because the lumen of the bronchus with which it communicates is usually obstructed by œdema or by granulation tissue. It demonstrates obstruction of bronchi by growth or pressure. It enables the bronchial tree to be demonstrated in some cases where an ordinary X ray gives little or no information owing to dense pleural thickening or widespread fibrosis. It can also be used to demonstrate the extent of pleural sinuses or fistulæ, although in cases of bronchial fistula it may not necessarily reach the pleura from the bronchial route. Although it usually demonstrates a cavity produced by tuberculous disease admirably, its use for this purpose is contra-indicated as a rule, especially if there be any activity of the disease. Other contra-indications are fever of any degree and marked iodine hypersensitiveness. Chandler and Wood rightly condemn its use in grossly septic conditions of the lung.

The X ray expert should usually be consulted in regard to the interpretation of the appearances yielded by his screen and film examinations, especially where he has a wide experience of chest examinations. His expert interpretation of the appearances, in the light of the clinical findings, which he should invariably be given, may be of the greatest assistance, whereas an interpretation of the X ray appearance alone may be misleading. In other words, his opinion may carry great weight in regard to the decision between alternative diagnoses. I have frequently to acknowledge with gratitude the assistance given me by radiologists in this matter. Time spent in consultation in the dark room, especially if the surgeon be also present, is usually time well spent.

Bronchoscopy.

Bronchoscopy has established itself as a valuable method of diagnosis and treatment in intrathoracic conditions, and its usefulness is not confined to diseased conditions of the trachea and bronchi. Its employment in regard to foreign bodies is now a commonplace, owing to the classical work of Chevalier Jackson. It would now appear that the thoracic surgeon must needs become an expert with the bronchoscope, or include a bronchoscopist in his team, since this instrument can give information of great importance in regard to abscess, bronchiectasis, bronchial obstruction from cicatrisation, pressure or growth, and in regard to tumours originating in the bronchi. To its use in treatment I shall refer later.

Thoracoscopy.

The introduction by Jacobaeus [35] in 1913 of the thoracoscope enabled the conditions within the pleura to be seen clearly after a preliminary artificial pneumothorax, notably such conditions as adhesions and pleural growths. It has also enabled the situation and relations of new growths of the lung and mediastinum to be studied, and it may be a useful preliminary to more active surgical measures of treatment in such cases. An improved form of the instrument has been described by Unverricht.[36]

Clinical Laboratory Methods.

These should be utilised fully. Sputum examinations should always be carried out and repeated with special precautions or special methods where necessary. Not only the tubercle bacillus and other pathogenic organisms, but also anaerobic saprophytes and organisms such as various spirochætes may be found and give indications for treatment. The possibility of streptotrichosis, blastomycosis, and other mould or fungus infection should be borne in mind in obscure

febrile destructive pulmonary diseases. Careful cytological and bacteriological examination of pus and other exudates as well as of the sputum may also give diagnostic information of value.

Biochemical methods may serve an ancillary function, notably in regard to calcium content, blood-sugar, blood-urea, and non-protein nitrogen estimations, which may be considered in assessing the suitability of a doubtful case. Blood counts, showing leucocytosis, may suggest pleural or pulmonary suppuration, or an eosinophilia may give valuable suggestions as to the presence of hydatid or other protozoal disease.

Complement-fixation tests may give information in regard to syphilis, tuberculosis, or hydatid disease. Another test which sometimes gives useful information, especially in regard to tuberculosis, is the "sedimentation rate" of the red corpuscles. It is of little value, if any, in diagnosis, but as a prognostic aid it seems likely to be of use. The value of the test is vitiated by the fact that the sedimentation rate is lowered in a variety of conditions other than tuberculosis. It has therefore at present only a relative value. At the same time, a persistently low rate is in my experience of grave significance, and a rising level as a result of treatment is an encouraging sign. It is markedly lowered in pleurisy and it shows a notable improvement in cases of artificial pneumothorax progressing favourably from the clinical standpoint.

Selection of Cases and Pre-operative Preparation.

The surgery of the chest should in nearly all cases be deliberate and unhurried. Emergency operations are exceptional and are practically confined to: (1) relief of tension in valvular pneumothorax; (2) partial aspiration of a large effusion causing dangerous pressure on the contralateral lung or leading to acute œdema of that lung; (3) immediate artificial pneumothorax in cases of grave and repeated hæmoptysis; (4) tracheotomy in bilateral abductor paralysis from pressure on both recurrent laryngeal nerves, a rare but well-recognised cause of urgent dyspnœa; (5) aspiration of a large and neglected empyema in a very gravely ill patient preparatory to operation by thoracotomy.

In nearly all other cases there is time for the most meticulous examination, and for all the necessary special investigations such as those mentioned in the previous section. The appeal to surgery should be made only after it is clear that medical measures are doomed to failure. On the other hand, in such cases the decision should be made as early as possible and certainly before the patient has become so debilitated that the risk of shock from operation outweighs the chances of success. Such delay is not fair either to the patient or the surgeon. On the other hand, the operative mortality from some of the more severe operations, particularly lobectomy, is considerable. The decision as to operation may therefore require a careful balance of the prognosis of the condition if untreated, with the immediate risks of operation, and the chances of ultimate success.

The mortality of these operations is steadily diminishing in expert hands, and is likely to do so progressively as surgical technique becomes more and more developed and the selection of cases becomes more eclectic. The preparation of the patient varies somewhat in the practice of individual surgeons. Most of them insist upon rest in bed under careful observation for from seven to ten days before such an operation as thoracoplasty or lobectomy. This often serves to establish relations of esteem and confidence between surgeon and patient, which may be of the utmost value. If there be any evidence of any catarrhal process such as coryza or bronchitis or any serious digestive upset, the operation is postponed. The condition of the mouth and nose is investigated, as any serious oronasal sepsis is a contra-indication. Purulent affections of the nasal sinuses naturally involve special risk. If there is marked anæmia a blood transfusion may be given. If the blood pressure is low—e.g., much under 120—attempts should be made to raise it, but a low pressure does not negative operation. Morriston Davies gives a course of tablets of suprarenal extract for ten days beforehand. Glucose is frequently given for a few days both by the mouth and with rectal saline injections. Alexander recommends digitalis if there is any cardiac weakness. Lilienthal suggests an investigation of the coagulation time beforehand, and if it is too long appropriate measures should be taken.

Before any operation for a condition with cavitation or dilated tubes, the utmost care is taken to promote expectoration before operation by expectorants and by "tipping" or change of posture. The strictest attention to details of this kind may make the difference between success and failure.

Developments in Anæsthesia.

The problem of anæsthesia in patients with disease of the chest has always been a difficult one, especially in regard to conditions like pulmonary tuberculosis, empyema, and any condition involving opening of the pleura. It is well recognised that in latent or quiescent tuberculosis general anæsthesia induced by chloroform or ether, or by mixtures of these substances, may be followed not infrequently by definite activity of the lung lesions, with more or less prolonged febrile exacerbations. For this reason it is advisable in operations on patients with pulmonary tuberculosis to employ local or regional anæsthesia when possible, and to use gas and oxygen rather than chloroform or ether for cases where general anæsthesia is essential. These facts account for the diversity of practice of chest surgeons in regard to the use of local or general anæsthesia.

There can be no doubt that the developments of local and regional anæsthesia have been of the greatest service in chest surgery, by lessening shock and post-operative pain and by enabling operations such as opening an empyema to be done with safety in patients seriously ill where a general anæsthetic would be dangerous, and this applies to children as well as to adults.

The fear of open pneumothorax led to the introduction of differential pressure methods of administering general anæsthetics. The first of these was introduced by Sauerbruch in 1904 at the instigation of Mikulicz. It was a small negative pressure chamber in which the surgeon and his assistants worked, the head of the patient being outside and his body inside, and the anæsthetic was given at atmospheric pressure. The pressure within the room was kept at 8 to 10 mm. Hg below the atmospheric pressure.

Positive pressure chambers were used, especially by Brauer, the conditions being reversed, the patient's body and the surgeon being in a room at atmospheric pressure, while the patient's head and the anæsthetist were in a small chamber at a slightly raised pressure. A similar result was obtained by various forms of mask.

These methods, though interesting historically, are now practically obsolete, since the striking researches of Meltzer and Auer in 1909. They showed that life could be maintained by the intratracheal administration of air in animals, even after all normal respiratory movements were abolished by curare, and after double open pneumothorax. It is interesting in this connexion to note that Vesalius in 1560 was aware that life could be maintained in this way and that it was again observed in 1667 by Robert Hook, who used bellows to supply the air. Elsberg,[37] in 1911, seems to have been the first to apply the intratracheal insufflation method of anæsthesia to the human subject. He was followed in this country by Kelly in 1912.[38] Cotton and Boothby,[39] in 1913, first showed that gas and oxygen could be administered in this manner, a demonstration which materially extended the possible applications of surgery to tuberculous patients.

There are now many ingenious forms of apparatus by which the anæsthetist is able to control the exact percentages of gas and oxygen, or of ether and air, supplied, and to vary the pressure at which the mixture is delivered into the trachea. He is thus able, at the

request of the surgeon, to deflate or inflate the lung on the opened side, while maintaining adequate ventilation of the sound lung and complete anæsthesia. It is often stated that gas and oxygen administration is followed by shock. This is not our experience at the Brompton Hospital, as it is administered by Dr. J. W. Magill.

The technique of anæsthesia, induced and maintained by an expert in these methods in a severe operation on the chest of a patient often weak and ill from prolonged disease, compels admiration in its orderly and almost perfect adaptation to the needs of the surgeon.

Improved Technique and After-care.

Time, the lessening of shock, and the prevention of too long exposure are factors of the utmost importance in thoracic surgery. Lilienthal [40] states that "rarely will a patient recover after an operation lasting more than 40 minutes of wide exposure." The ingenuity and attention devoted to the production of special instruments for removing the periosteum from the ribs and for their cutting are all striking, as are also time-saving details in the operative technique developed individually by surgeons in their practice. Equally important to the surgeon is the organisation of his team of assistants. Efficient, experienced, prompt, and purposive help are greatly saving of time. Mr. Morriston Davies tells me that he is so convinced that loss of heat is an important factor in shock that he keeps the operating theatre at a minimum temperature of 80° F. for thoracoplastic operations.

The after-care, especially in regard to the dressing applied and the degree of pressure exerted by it in cases of thoracoplasty, and the special nursing arrangements required by these patients, especially in regard to position in bed, cough, and expectoration, are all vitally important.

The Aims and Methods of Surgery in Diseases of the Chest.

Limitations imposed by time and my own lack of experience of the effects of surgery of the œsophagus, the heart, and the great vessels, compel me to restrict my review to the applications of surgery to diseases of the bronchi, lungs, pleuræ, and mediastinum.

We may now consider what help surgery can offer to the physician in the treatment of cases of chest disease. Almost before the dawn of the modern applications of surgery to this branch of medicine, Glück [41] wrote "ubi hæmorrhagia, ibi ligatura, ubi tumor, ibi extirpatio, ubi pus, ibi incisio," a pronouncement epigrammatic and terse, if hardly classical. Unfortunately his recommendations are, as we now know, often impracticable.

The chief ways in which surgery can aid in disease or damage of the structures in the chest are: (1) By securing rest to the part involved, particularly in disease of one lung. (2) By evacuating abnormal exudates, whether serous, purulent, hæmorrhagic, or chylous, at the right time and in the most effective manner. (3) By removing foreign bodies. (4) By collapsing cavities. (5) By excision or extirpation of growths or cysts of the bronchi, lungs, pleura, or mediastinum when practicable. (6) By the removal of diseased or damaged lung tissue which is beyond hope of repair, if it is sufficiently localised. (7) By decompression, where intrathoracic pressure relations are disturbed. (8) By exploratory thoracotomy to discover whether radical surgical measures are practicable in obscure lung conditions.

The chief measures designed to these ends may be enumerated: (1) Those designed to produce collapse or compression of diseased lung tissue: (*a*) Artificial or therapeutic pneumothorax. (*b*) Cutting adhesions where these prevent complete or effective collapse, a procedure sometimes dignified by the misleading name of "intrapleural pneumolysis." (*c*) Thoracoplasty, especially the posterior paravertical operation of Sauerbruch. (*d*) Extrapleural pneumolysis—packing by various tissues or extraneous substances to complete the compression of the lung where thoracoplasty alone is insufficient, more especially at the apex—then called apicolysis. (*e*) Phrenic paralysis, either temporary—phrenicotomy, or permanent—phrenic evulsion or exairesis.

(2) Evacuation of exudates is not always a matter of mere paracentesis or incision. The fear of open pneumothorax has given place to the more real anxiety to avoid widespread infection of the pleura. Some intrapulmonary collections are more safely evacuated through the bronchi by induced collapse, others by bronchoscopic washing out, and others by a two-stage thoracotomy and pleurotomy, the first stage to produce pleural adhesion, the second to incise the lung.

(3) Foreign bodies may be removed through the bronchoscope, or if this fails or is impracticable, by thoracotomy. The main bronchi can be reached by an extrapleural route, the divisions only by actual pneumotomy.

(4) New growths of the bronchi of simple character may be removed through the bronchoscope. Growths in the lung, if operable, usually involve removal of part of the lung—lobectomy. Growths in the mediastinum may be dealt with either by a transpleural route after a preliminary pneumothorax or by a direct thoracotomy involving removal of several pieces of rib. A trans-sternal route of approach is also often valuable.

(5) For the removal of diseased or damaged lung, the operation of lobectomy is theoretically the operation of choice, and this operation will be discussed in connexion with bronchiectasis and new growth.

(6) Measures to secure decompression or relief of increased thoracic pressure, either pleural or mediastinal: (*a*) withdrawal of air or fluid by paracentesis; (*b*) removal of ribs or cartilages as in Brauer's operation of cardiolysis for adherent pericardium. It is suggested that a similar procedure may in rare cases be helpful in cases of raised intrathoracic pressure from inoperable growths. Here, again, a trans-sternal or sternum-splitting operation may be helpful.

(7) Exploratory thoracoscopy as introduced by Jacobaeus is sometimes useful, but seems likely to be displaced by exploratory thoracotomy, which enables a more complete investigation to be made.

The principle of pulmonary collapse which is the basis of artificial pneumothorax treatment, and of some of the chief surgical procedures, is so fundamental that it is worth while to study briefly what effects it can produce.

In collapse by artificial pneumothorax the lung is allowed at first to retract away from the chest wall by its own elasticity, and later, if necessary, it can be compressed against the mediastinum by positive pressure. It thus becomes collapsed and airless, while cavities and dilated tubes are emptied. It has been shown by Bruns that the collapsed lung contains less blood and that the amount of blood circulating through it is diminished. As a necessary consequence the blood-flow through the uncollapsed lung is increased and a compensatory hypertrophy of the right ventricle develops. Graetz,[42] Shingu,[43] and others have shown that there is lymph stasis with dilatation of the lymph-vessels. Leroy Gardner [44] has demonstrated that this dilatation occurs at the periphery, with obliteration in the centre. If collapse is long maintained, a general increase of fibrous tissue may result, though this is not invariable. Caseous areas may be partly dried up and partly discharged by the bronchi, and not infrequently they become calcified. Cavities may disappear owing to falling in and coalescence of their walls. The pleura may be greatly thickened after prolonged collapse and fibrous bands may extend from it into the lung tissue. There is often marked fibrous thickening of the walls of the blood-vessels and bronchi. In spite of considerably advanced fibrosis, complete or partial expansion can occur when the treatment is terminated, even after several years'

collapse. At times, however, the lung fails to expand, and in such cases surgical aid may be required.

In thoracoplasty similar changes occur, though they are produced by allowing the chest wall to fall back upon the lung, more or less completely immobilising it but not obtaining such a complete collapse. On the other hand, it is a permanent deflation of the lung, and is maintained by the thickening of the pleura and by the new growth of bone from the periosteum stripped up from the sections of ribs removed.

It is important to note that both procedures may promote emptying of cavities, either pulmonary or bronchiectatic, though closure of the latter does not usually result. Indeed, after the use of lipiodol in bronchiectatic cases it is wise to allow time for this to be largely evacuated before collapse is induced, otherwise it may be pent up. It is significant in this connexion that in one of my cases of bronchiectasis at present at Frimley convalescing after thoracoplasty, the operation reduced the sputum from 20 ounces to 4 drachms in the day, yet when he was tightly strapped because of some pain he brought up 10 ounces of sputum within the next day.

The beneficial effects of these collapse forms of treatment comprise far more than the mere mechanical effects just described. Some immediate reactive changes often occur, especially after thoracoplasty, leading sometimes to febrile reaction and temporary loss of weight; this is soon followed in successful cases by a remarkable improvement in the general condition of the patient and by abatement and eventual disappearance of symptoms such as cough, fever, and night sweats. In other words, the toxæmic features become abolished. This is explained by the relative lymph stasis and by the cessation of movements of the lung, giving less opportunity for the absorption of the toxic products of bacterial activities. This in turn helps to improve the local condition, since the immunity processes are less swamped by these toxic products.

In my next lecture I propose to consider the applications of surgical methods to diseases of the lungs and bronchi.

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OBSERVATIONS ON THE LOCALISATION OF INTRACRANIAL TUMOURS.

THE DISCLOSURE OF LOCALISING SIGNS FOLLOWING DECOMPRESSION OR VENTRICULOGRAPHY.

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No one can have experience of intracranial surgery without perceiving how difficult it may be to localise an intracranial tumour, and how often operation is performed without the tumour being found. The object of this paper is to show that surgical intervention which falls short of removal of the tumour may so alter the signs and symptoms of the tumour as to enable a more accurate localisation of its position to be made. Changes of a similar nature sometimes occur in cases of tumour of the spinal cord after lumbar puncture has been performed. These are easy to interpret and may therefore be conveniently considered before the more complicated changes that attend surgical interference in cases of intracranial tumour.

The Effect of Lumbar Puncture in Spinal Cord Tumours.

It is well known that withdrawal of cerebro-spinal fluid by lumbar puncture may aggravate the signs and symptoms of a spinal cord tumour. The example may be quoted of an elderly lady who was carried into the Peter Bent Brigham Hospital suffering from paralysis of both legs. For the previous seven months she had complained of increasing weakness of the right leg, but she had been able to walk without assistance until one week before admission when, following a lumbar puncture, her legs became completely paralysed. At operation Dr. Cushing removed an intradural meningioma from alongside the mid-thoracic spinal cord and the patient made a complete recovery.

There is little doubt that in this case the withdrawal of cerebro-spinal fluid by lumbar puncture was directly responsible for the great increase of physical signs, thus converting an uncertain clinical picture into one of obvious spinal cord tumour. Presumably the withdrawal of spinal fluid so altered the position of the tumour as to produce a greater degree of pressure on the spinal cord, or on its blood-supply, with resulting loss of function.

It is thus seen that lumbar puncture, which might be termed a "minor injury" of the nervous system, is of value in diagnosis of tumours of the spinal cord, not only because it frequently reveals characteristic changes in the spinal fluid, but also because it may so aggravate the pre-existing signs and symptoms as to produce a clinical picture which is easily recognised as one pertaining to tumour. The changes which follow lumbar puncture may be much less prominent than those which occurred in the case of the old lady, and it is therefore important that after lumbar puncture in cases of suspected spinal cord tumour we should deliberately repeat the neurological examination in order to search for an extension of the physical signs. Increase in the signs may be taken as evidence of the presence of a tumour.

Dr. R. A. Young: References.

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Observations of this nature have been made by numerous workers in the past, notably by Elsberg.[1] That analogous changes may be observed in cases of intracranial tumour does not seem to have been so generally recognised, yet it is clear from the examples presently to be described that such changes do occur and that they may become a vital factor in the successful conduct of any one case.

What forms of injury are likely to aggravate the signs and symptoms of an intracranial tumour? Withdrawal of cerebro-spinal fluid by lumbar puncture will often do so, but to such extent that it may produce sudden death, and for this reason lumbar puncture is held to be dangerous in all cases of suspected intracranial tumour that show signs of hydrocephalus. The mechanism of herniation of the cerebellar tonsils and medulla oblongata through the foramen magnum, which is responsible for the fatalities after lumbar puncture, is well known, and therefore need not be elaborated here. The surgical procedure which more commonly than all others is seen to aggravate the signs of intracranial tumour is an osteoplastic exploration that fails to disclose the tumour. This is known in neuro-surgical parlance as "the negative exploration."

The Negative Intracranial Exploration.

When we consider that an expert neurologist after most thorough clinical examination may be unable to make an accurate diagnosis of the situation of an intracranial tumour, and that many parts of the brain are difficult of access, it is, indeed, not surprising that intracranial tumours are often difficult to find at operation, the more so as only a limited portion of the surface of the brain can be exposed at a single exploratory operation, and the presence of a deep-seated tumour may be easily overlooked. The advent of ventriculography has provided us with an additional diagnostic weapon of great importance, yet this procedure is not so free from danger that it can ever supersede the exhaustive clinical investigations upon which we have hitherto based our efforts to localise intracranial tumours, and there are many cases of unlocalised tumour associated with great rise of intracranial pressure in which its use is definitely contraindicated. In such cases the method of ventricular estimation[2] may be used as an aid to diagnosis, but it not infrequently happens that a fairly confident opinion as to the situation of the tumour is formed on the history and physical signs alone, and the surgeon, without resorting to ventricular estimation, explores part of the brain by turning down an osteoplastic flap and fails to find the tumour. He may then seek to reduce the raised intracranial pressure by leaving a decompression, and in this way many patients with intracranial tumours are temporarily relieved of their symptoms even though the tumour has not been removed. Experience teaches, however, that certain patients become definitely worse. This change for the worse that may follow a negative exploration and decompression has in the past played havoc with the peace of mind of those who have attempted neurological surgery, and one operator of experience has confessed to me that whenever he had performed a craniotomy without discovering the tumour he dreaded to approach the bedside on the following day for fear of finding that his patient had become afflicted with hemiplegia, aphasia, or some other symptom that was not present before operation. While in the past this aggravation of symptoms after a negative exploration and decompression was frequently due to gross injury of the brain at the time of operation, or to the formation of a post-operative clot, we are now, thanks largely to the work of Prof. Harvey Cushing, possessed of an operative technique so delicate that injury of the brain at operation can be avoided by all those who have the patience to master and employ the appropriate methods. If we may assume that the brain has been treated with proper gentleness at operation, and that the field of operation has been left dry, it is almost certain that any new signs and symptoms that make their appearance after operation must be due to alteration in the position or size of the tumour, occasioned by release of pressure in one part of the intracranial chamber. This obvious inference and all that it implies does not appear to have received in the past the attention that it deserves. Its importance was impressed on me by several cases that I saw during a year's experience as assistant resident surgeon to Dr. Cushing, and particularly by the following case.

A Case Related.

The patient was a young woman, aged 20, admitted to the Peter Bent Brigham Hospital on Nov. 22nd, 1926.

Clinical History.—Her illness had begun nearly six years before with fleeting attacks of numbness of the right side of the body. These were followed by "fainting spells" and, within a year, by generalised convulsions. After each convulsion she would have violent headache, mostly occipital, and vomiting for two to three days.

For eight months she had noticed that she could not see to the right, and had experienced a feeling of eye-strain and occasional diplopia. In addition, there had been some unsteadiness in walking and difficulty in swallowing; also some loss of memory.

Examination showed bilateral papillœdema with considerable secondary optic atrophy. There were signs suggesting cerebellar disturbance—namely, nystagmus, generalised hypotonia and ataxia, and staggering gait. But investigation of the visual fields showed complete right homonymous hemianopsia. There was also diminished sensation to pin-prick on the right half of the body. Spontaneous speech was normal, but there was slight difficulty in naming objects. Her speech, however, was examined by several observers, and it was finally concluded that this questionable defect of speech was of no significance.

Diagnosis.—The main signs were right homonymous hemianopsia, signs of cerebellar disorder, and papillœdema. The diagnosis thus lay between tumour of the left temporal and left occipital lobes. Looking back it is difficult now to see how a mistake was made, but at the time the right-sided analgesia was disregarded, and it was considered that absence of muscular weakness and of definite aphasia favoured an occipital location. Occipital tumours and the cerebellar signs produced by them were being made the subject of special study at the time, and probably this weighed unduly in the decision to explore the occipital lobe.

First Operation (Nov. 26th, 1926).—Dr. Cushing reflected an osteoplastic flap to expose the left occipital lobe. The brain protruded and everywhere showed flattening of the convolutions, but there was no sign of tumour. The left lateral ventricle was tapped and appeared to be displaced medially. In closing it was necessary to sacrifice the bone of the flap. During convalescence the patient became obviously dysphasic and also showed marked weakness and spasticity of the right arm and leg, together with impairment of postural sensibility on the right side. These further signs, considered in conjunction with the right homonymous hemianopsia, left no doubt that the tumour was actually situated in the left temporal lobe.

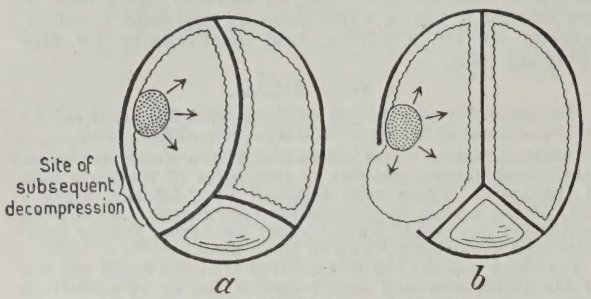
Second Operation (Jan. 6th, 1927).—Dr. Cushing turned down an osteoplastic flap over the middle portion of the left cerebral hemisphere, using the anterior limb of the former occipital exploration as the posterior limb of this new flap. In the cortex of the temporal lobe, and only 2 cm. in front of the area which had been explored at the previous operation, lay a large, soft avascular tumour. Tumour tissue to the size of a hen's egg was removed, mainly by suction. In closing it was again necessary to sacrifice the bone of the flap.

Subsequent Course.—After operation vision and speech improved, the headaches disappeared, and the attacks of unconsciousness became less frequent. On discharge from hospital, however, she still had some motor weakness and sensory loss over the right half of the body, also some difficulty in naming objects. The visual fields had not changed.

Comment on Case 1.

The importance of this case to our present thesis lies in the great increase of physical signs which followed exploration and decompression of the occipital region. A questionable difficulty in naming objects was converted into an obvious dysphasia. Paresis and disturbance of postural sensibility of the right side appeared as new signs. From our knowledge of localisation of cerebral function it is obvious that none of these signs could possibly have been due to local disturbance of the occipital lobe at or

after operation, and the reasonable inference was that they were attributable to a tumour of the left temporal lobe which, as a result of the occipital decompression, had become altered in size or in its relation to the left cerebral hemisphere. The change is represented diagrammatically in the figure. It is



In (*a*) is shown the probable state of affairs before operation. The presence of the tumour results in displacement of the falx cerebri to the opposite side. When the occipital decompression has been made (*b*), the occipital lobe bulges through the decompression. Owing to relief of pressure the falx tends to become straight. In addition the tumour is probably displaced backwards.

possible that withdrawal of fluid from the occipital horn of the left ventricle during the course of the first operation also played some part in the production of the fresh signs.

What happened in this case may occur in other cases where craniotomy has failed to disclose a tumour. After such an operation signs hitherto latent may declare themselves, and it is thus not infrequently possible to make a further and more accurate localisation of the tumour and to repair the original mistake in diagnosis by a second operation. Recognition of this principle has not been sufficiently stressed in the past, and doubtless in many cases its working has been overlooked because of a tendency to cease making neurological examinations once operation has been performed. In many cases the changes are so slight as only to be detected by thorough examination. In other cases the changes are more severe than in the case cited above. The fatal hyperthermia which is so liable to follow in the wake of simple decompression operations for tumours of the brain stem, such as pineal tumours,[3] and suprasellar cysts or adamantinomata,[4] is probably due to a shift in the position of the tumour in its relation to the vegetative centres of the hypothalamus. At present, however, too little is known of temperature control in man to render elaboration of this idea of any value.

It is clear that the possible effect of a shift of the tumour should always be considered when simple decompression operations are performed. When an osteoplastic exploration has been carried out and the tumour has not been found, there should be no relaxation of clinical observation. Almost at once neurological examination may reveal further signs which indicate unmistakably where the tumour lies, and the way will be open to retrieve the life and preserve the well-being of the patient by removal of the tumour at a second operation.

Ventricular Puncture and Ventriculography.

The following case is one of several in which fresh signs and symptoms appeared after replacement of the fluid of one lateral ventricle by air.

CASE 2.—A married woman, aged 45, was admitted to the hospital on April 4th, 1927.

Clinical History.—Her illness began 15 months before admission with loss of energy and initiative. Nine months before admission she began to suffer from headaches in the occiput and back of the neck. At this period her left leg began to drag while she walked, and at times it would give way and she would fall. After a vacation in August, 1926, she became very much better and remained perfectly well, except for an occasional slight headache until February, 1927, when, six weeks before admission, the headaches and weakness of the left leg returned. The leg was so weak that she was unable to stand. Her left hand also became weak, and in it she began to experience attacks of numbness which lasted five minutes. Her speech became slow, and she had difficulty in remembering the names of her friends. Her memory had been failing for about four months before admission. She was right-handed.

Examination.—The patient showed entire lack of anxiety about her condition, and was at times euphoric and subject to outburst of excessive laughing. Occasional incontinence of urine and fæces. Bilateral papilloedema. Slight weakness, slight ataxia and dysmetria of the left arm and leg. Inability to stand. Absence of left abdominal reflexes. Bilateral extensor plantar response.

The case thus appeared to be a fairly obvious tumour of the right frontal lobe, but some doubt was felt about this in view of the fact that sense of smell was impaired on the left side. Further examination also showed occasional weakness of the right side of the face. It was therefore decided to do ventriculography.

Ventriculography.—The left lateral ventricle was tapped through the posterior parietal region; 10 c.cm. of fluid were withdrawn and replaced by a similar amount of air. Thirty minutes after the air was injected, while the ventriculograms were being developed, the right arm was noticed to become extremely weak. There was also distinct weakness of the right side of the face and speech became slurred. The ventriculograms confirmed these recent clinical signs in showing a defect in the anterior horn of the left lateral ventricle.

Operation and Subsequent Course.—Accordingly on the day after ventriculography, the left frontal lobe, instead of the right frontal lobe, was explored. A tumour was found at the anterior pole of the left frontal lobe; over its surface was spread a delicate film of recent blood-clot. The tumour, a glioma, was almost completely removed, and the patient did well. Her mentality became normal, and she was able to walk quite well before her discharge from hospital about three weeks after operation.

Comment on Case 2.

This case affords a good illustration of the way in which a tumour of one frontal lobe may simulate a tumour of the opposite frontal lobe, but we are only concerned here with the alteration of physical signs that followed ventriculography and the manner in which it was produced. In this connexion it is important to note that a thin film of blood-clot was found on the surface of the tumour at operation. This clot was red, easily detached, and therefore evidently recent. There was, however, no reason to suppose that the clot was the result of hæmorrhage during the course of the operation, for there was no injury of the dura during the preparation and reflection of the osteoplastic flap, and the early stages of the operation were without incident. As soon as the flap was raised the clot was visible through the dura mater as a circular bluish-red area. In view of these observations it is probable that the clot was produced at the time of the ventriculography on the previous day. Withdrawal of fluid from the left lateral ventricle prior to the injection of air would tend to cause separation of the frontal lobe from the overlying dura mater, and may thus have resulted in rupture of some delicate vessel passing between dura mater and the surface of the tumour. It is always noticeable at operations that the anterior pole of the frontal lobe, more than any other part of the brain, tends to fall away from the overlying dura mater when the corresponding lateral ventricle is tapped.

Inasmuch as the air was injected into the left lateral ventricle by passage of a brain needle through the left parietal region, it is necessary to inquire whether the weakness of the right arm and face and the slurring of speech which followed within 30 minutes of ventriculography may not have been due to disturbance at the site of tapping in the left parietal lobe. There are no direct observations on this question, since neither the site of puncture nor the track of the brain needle was inspected at the subsequent operation. In a personal experience of ventriculography performed through the parietal

region, I have met with no other case that was followed by symptoms which could be referred to the site of brain puncture, but Dr. John Fulton tells me that he has seen a case in which symptoms occurred. In his case, however, the symptoms were not motor in character as in Case 2, but consisted of numbness and tingling in the opposite hand which came on at the very moment when the needle was being passed through the parietal lobe. In the case under discussion it seems more reasonable to attribute the symptoms that appeared after ventriculography to disturbance of the tumour itself. And the blood-clot which was found at operation on the surface of the tumour probably represents part at least of the disturbance.

The successful diagnosis and, depending so largely on the diagnosis, the successful outcome of this confusing case are to be attributed primarily to information furnished by the ventriculograms themselves, yet interpretation of these was difficult, and valuable evidence was obtained from neurological examination of the patient after the injection of air. Ventriculography intensified the clinical picture so that what had hitherto been nebulous in the light of current neurological knowledge now became clear.

The Misuse of Ventriculography.

It is scarcely necessary to point out that provocation of an intracranial tumour by ventriculography is not a thing to be desired or deliberately sought after. The degree to which the signs and symptoms may be aggravated by injection of air cannot be accurately predicted or controlled, and a certain number of fatalities will inevitably occur if air is used in cases that show a severe rise of intracranial pressure—that is to say, in cases which show a high degree of papillœdema, stupor, or intense headaches and vomiting. There are, however, a number of other cases where the rise of pressure is but slight or moderate, in which ventriculography is clearly indicated, because no exact localisation of the tumour can be made by clinical means, and the danger of failing vision precludes any delay. The fact that in such cases as these the symptoms may be aggravated or altered by injection of air is a clear indication that there should be as little delay as possible between ventriculography and removal of the tumour. The experience of Case 2 shows that the disturbance occasioned by ventriculography may take effect very quickly after the injection of air. Elsewhere [5] I have reported a case of hydatid cyst of the right occipital lobe in which, during the four days that followed ventriculography, the patient sank insidiously into a state of coma, from which he was only rescued by the most urgent measures. The literature now contains a number of records of cases of intracranial tumour in which the patient died a few days after ventriculography, though the relationship of injection of air to the aggravation of the patient's symptoms is not often commented on in the case reports.

Withdrawal of the air after the skiagrams have been taken will mitigate to some extent the danger of ventriculography, but too much stress cannot be laid on the fact that ventriculography should be followed with all possible speed by removal of the tumour at operation. The use of ventriculography by anyone who is not prepared to proceed, at once if necessary, with the surgical removal of the tumour is fraught with grave risks, and can only bring discredit to a method which, when properly used, is a valuable adjunct to clinical investigation.

Conclusion.

Evidence has thus been brought forward to show that the signs of intracranial tumours may alter after ventriculography and osteoplastic craniotomy and decompression. If these surgical procedures have been carried out with no error of technique the changes that occur in the clinical picture are to be attributed to change in position or size of the tumour itself. By recognition of this principle it is sometimes possible to make a successful diagnosis of the situation of a tumour that has already been sought for at operation without success. It is therefore advisable that a negative intracranial exploration should always be followed by careful neurological examination.

Observations have been reported that indicate the manner in which ventriculography may endanger life, even in those cases where its use is not contra-indicated by the clinical condition of the patient. To prevent loss of life in these cases it is urged that ventriculography should be followed at the earliest possible moment by removal of the tumour.

I desire to thank Dr. Harvey Cushing for permission to report these cases. It is scarcely necessary for me to point out that, while I must shoulder the responsibility for any conclusions that have been reached, the central idea of this paper arose from observing him at work in Case 1.

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THE CHOLESTEROL METABOLISM DURING PREGNANCY.

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AND
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At the present time our knowledge of the normal metabolism of cholesterol is limited, but extensive changes in it have been shown to occur in patients with certain diseases and have attracted increasing attention to this subject. We know that there is a great increase in the percentage of plasma cholesterol (both free and ester forms) in subacute parenchymatous nephritis, associated with an increase of the cholesterol ester content of the kidney. Hypercholesterolæmia has also been reported in pregnancy, diabetes, cholelithiasis, arterio-sclerosis, &c. Indeed, in order to explain the fact that 75 per cent. of cases of cholelithiasis occur in women, it has been suggested that hypercholesterolæmia occurring in repeated pregnancies is of paramount importance in the formation of gall-stones. The suggestion, however, does not help to explain the occurrence of gall-stones in men; also we have found in an examination of post-mortem records of this hospital that cholelithiasis had not occurred in cases of subacute parenchymatous nephritis, where hypercholesterolæmia rules much higher than in pregnancy. Some clinicians have even gone so far, on such scant evidence, as to eliminate from the diet of cases of cholelithiasis all substances rich in sterols, such as eggs, milk, butter, and other fatty foods, and have also suggested that the diet should be restricted in this way during pregnancy.[1]

Reports on the occurrence of hypercholesterolæmia must, however, be reviewed critically. Most observers use a definite figure such as 0·16 per cent., or other figure of similar order, as representing the cholesterol content of the blood, and any figure over this they regard as constituting hypercholesterolæmia. We [2] have shown that the normal cholesterol content of the plasma varies between wide limits, but that in a given individual in a state of health the plasma cholesterol tends to remain at a fairly constant level

for long periods. Hence in order definitely to establish a true hypercholesterolæmia it is necessary either that the cholesterol content of the plasma should be raised above the normal maximum limits or that, in the case of an individual whose normal plasma cholesterol content is known, the value should be definitely higher than in health. Bearing these results in mind we have thought it important to investigate the changes in the plasma cholesterol during pregnancy, especially as a "free" form, at any rate in normal subjects, whereas the plasma contains both forms. We have, in earlier papers, repeatedly stressed the importance of determining both the free and ester cholesterol rather than the total, because the distribution of cholesterol throughout the body suggests that the two forms have not the same significance in metabolism. In many of the papers mentioned only total cholesterol values have been recorded. Tyler and Underhill have

The Figures in the Table represent Weight of Cholesterol per 100 g. of Plasma.

Case.	Date.	Gravid.	Duration of pregnancy in weeks.	Date of parturition.	Age.
1	Feb. 13 Apr. 16 May 14 June 11 Free 0·0505 0·1229 0·1700 0·0898 Ester 0·1029 0·0733 0·0367 0·0662 Total 0·1534 0·1962 0·2007 0·1560	1	40	July 24th	23
	July 9 July 30 Aug. 3 Free 0·1071 0·0486 0·0583 Ester 0·0669 0·1182 0·1187 Total 0·1740 0·1668 0·1769				
2	Mar. 19 Apr. 16 May 14 June 11 Free 0·0679 0·1181 0·0982 0·1456 Ester 0·1375 0·1065 0·0991 0·0640 Total 0·2054 0·2246 0·1973 0·2096	2	42 ?	Aug. 15th	35
	July 9 July 30 Aug. 20 Aug. 24 Free 0·1097 0·1416 0·0596 0·0670 Ester 0·1040 0·1221 0·1023 0·0958 Total 0·2137 0·2637 0·1619 0·1628				
3	Mar. 19 Apr. 16 May 14 Free 0·0966 0·0826 0·1623 Ester 0·1880 0·1596 0·0982 Total 0·2846 0·2422 0·2605	2	42	June 26th	31
	June 4 July 2 July 13 Free 0·1082 0·0794 0·0905 Ester 0·1394 0·1120 0·1322 Total 0·2476 0·1914 0·2227				
4	Feb. 20 Apr. 16 May 14 Free 0·0772 0·2484 0·2317 Ester 0·1535 0·0881 0·0585 Total 0·2307 0·3365 0·2902	1	40	June 11th	22
	June 4 June 16 Free 0·1326 0·0925 Ester 0·1384 0·1713 Total 0·2710 0.2638				
5	Mar. 19 Apr. 16 July 2 July 23 Free 0·0677 0·2515 0·0834 0·0644 Ester 0·1161 0·0259 0·1696 0·1304 Total 0·1838 0·2774 0·2530 0·1948	1	40	July 15th	24
6	Feb. 20 Mar. 26 Apr. 16 Aug. 2 Free 0·1513 0·0785 0·0703 0·0941 Ester 0·0125 0·0664 0·0755 0·0773 Total 0·1638 0·1449 0·1458 0·1714	1	40	July 28th	19
7	Feb. 13 Mar. 26 Apr. 5 July 9 Free 0·1147 0·1187 0·2025 0·0749 Ester 0·2537 0·2784 0·1749 0·1158 Total 0·3684 0·3971 0·3774 0·1907	1	40	Mar. 30th	26
8	Mar. 27 Apr. 5 July 10 Free 0·0640 0·1054 0·0552 Ester 0·1295 0·1051 0·1005 Total 0·1935 0·2105 0·1557	1	40	Apr. 2nd	27
9	Apr. 18 May 25 June 16 Free 0·1671 0·1491 0·0789 Ester 0·0900 0·1101 0·1608 Total 0·2571 0·2592 0·2397	1	41	May 18th	31
10	Apr. 25 May 10 July 26 Free 0·2692 0·2400 0·0743 Ester 0·0059 0·0341 0·1420 Total 0·2751 0·2741 0·2163	3	40	May 6th	23
11	Feb. 20 May 14 Free 0·0693 0·1064 Ester 0·1448 0·1143 Total 0·2141 0·2207	2	38	May 24th	38

Remarks.—CASE 3. Albuminuria. No nitrogen retention. Hydramnios. Some post-partum sepsis and pyrexia. CASE 8. Albuminuria. Slight œdema of legs. Fit during labour. CASE 9. Albuminuria, a trace. CASE 10. Normal pregnancy. Had eclampsia two years previously.

Patient's initials.—Case 1, E. C.; 2, M. L.; 3, M. B.; 4, B. G.; 5, A. O.; 6, I. W.; 7, A. S.; 8, F. L.; 9, O. V.; 10, D. W.; 11, W. B.

critical examination of previous work shows some of it to be vitiated by recognised fallacies.

Blood analyses during pregnancy have been reported by Chauffard and his collaborators,[3] by Herrmann and Neumann,[4] Klinkert,[5] Schimpert and Huffmann,[6] Mauriac and Strymbau,[7] Denis,[8], Bloor,[9] Slemons and Stander,[10] Pribram,[11] Kuster,[12] and by Tyler and Underhill,[13] with the general conclusion that hypercholesterolæmia occurs in pregnancy and the early puerperium.

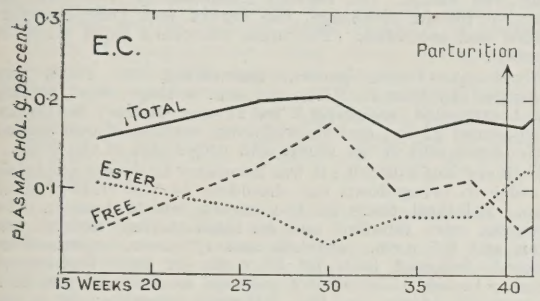
The Fallacy in Total Cholesterol Estimations.

The cholesterol throughout the body is present in two forms: as "free" cholesterol and also in combination with fatty acids, as esters. In the red blood cells practically all the cholesterol is present in the

presented a large amount of analytical data giving both free and ester values during pregnancy, but the cholesterol determinations were made on whole blood. This method must tend to mask certain changes, since the cholesterol of red corpuscles is mainly, if not entirely, in the "free" state and is fairly constant in amount, whereas the cholesterol of the plasma is present in both free and ester forms, the latter usually in preponderating quantity. Hence an analysis of whole blood, including the almost constant sterol content of red cells, tends to diminish the value of quite large changes in the plasma cholesterol. Another factor which may vitiate conclusions, drawn from analyses of whole blood, as to changes of cholesterol metabolism in pregnancy, is the phenomenon of the anæmia of pregnancy, which varies markedly in

different individuals and is often of considerable degree. There is, however, a more serious objection to Tyler and Underhill's results, which they acknowledge in their paper. Their method consisted in choosing ten women from each lunar month of pregnancy, and, with rare exceptions, different women were taken each month. The results of the analyses of the blood specimens were then averaged. This average figure, however, is an average of series of figures in which the variations from the mean are very considerable, as will be seen from a study of their tables. Mathematically, an average figure obtained from such a few cases,

CASE 1.

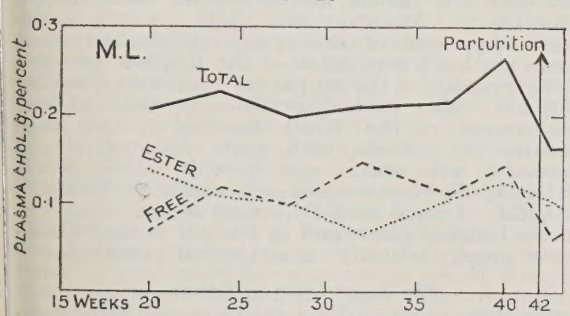


showing such wide variations, can have little value; just as in a study of the normal cholesterol content of plasma the significant values are the limits of variation and not the arithmetical average, which is less important. Finally, their results were obtained by colorimetric methods of analysis, which have been much criticised,[14 15 16 17] though in all probability the results of such methods are relatively correct.

The Present Investigation.

In our investigations we have examined a number of women attending the antenatal clinic at St. George's Hospital who were admitted to the lying-in ward for parturition. Owing to the hour of the clinic we were unable to take blood specimens in the "fasting" condition.[18] However, these women

CASE 2.

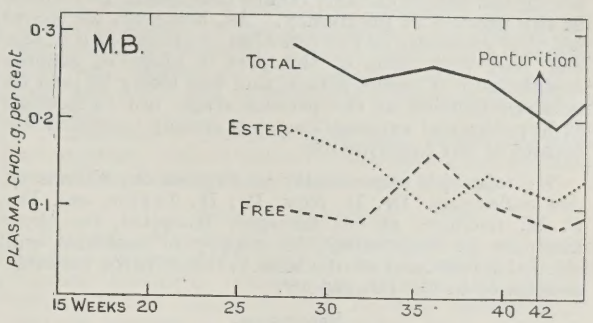


always attended at the same time of day, and, though it was practically impossible to control their previous feeding, this factor does not appear to have affected the results. Blood specimens were taken at monthly intervals before parturition and once or twice during the period of confinement. The analytical method used was that already described by us in detail [2] and, as 20 c.cm. of blood were required for each analysis, we were limited in our observations by the willingness of our subjects.

Our results are shown in the table; where a sufficient number of determinations were made the results are illustrated by graphs. The graphs are all characteristic, despite the fact that it was impossible, for obvious reasons, to obtain a sufficient number of blood samples to determine the exact shape of the curve. In the other cases in which still fewer observations were made, the results are in general agreement with the results from the more fully examined subjects.

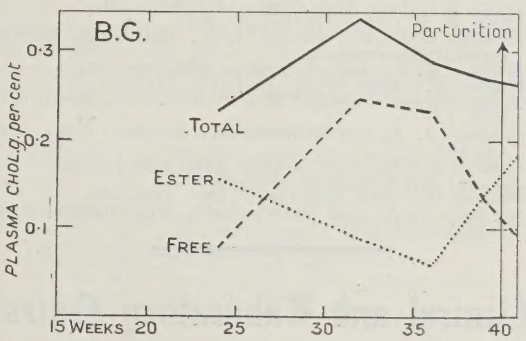
It will be seen that: (1) The free cholesterol of the plasma increases during pregnancy up to a maximum

CASE 3.



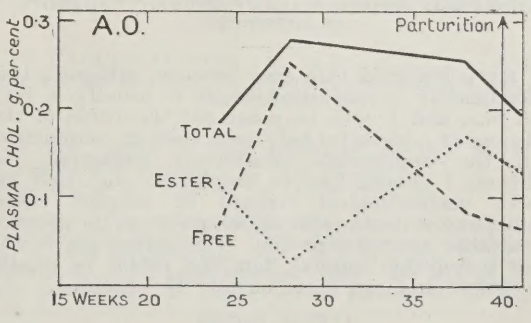
at about the thirtieth week; concurrently the ester cholesterol falls to a minimum at about the same time. (2) From the thirtieth week, more or less approximately, the amount of free cholesterol decreases and the ester cholesterol increases till an almost normal ratio of free to ester cholesterol is

CASE 4.



attained before or near parturition. (3) The plasma cholesterol values are generally normal in the first week or two of the puerperium. (4) Some cases show a definite total hypercholesterolæmia in which the total cholesterol figures run roughly parallel to the free cholesterol values. This is in general agreement with the results of the earlier observers, and our actual figures are of much the same order as theirs.

CASE 5.



During pregnancy there is a marked disturbance of the cholesterol metabolism which results in large changes in the ratio of free to ester cholesterol in the plasma, but to less definite changes in the total cholesterol.

We were tempted at first to correlate our results with changes that occur during the development of

the fœtus in the later months of pregnancy—for example, with the rapid growth of the brain and the accompanying marked tissue differentiation, since this organ is the richest of all organs in free cholesterol; or to suggest that the high free cholesterol in the mother's blood might serve the purpose of counteracting the effects of toxic bodies that might be formed in the process of pregnancy. As, however, we know nothing whatever of the function of cholesterol in the cell, and very little of the part it plays in general metabolism, it seems better, and less likely to lead to misapprehension at the present stage, not to indulge in hypothetical explanations, but simply to record the results of our experiments.

We take this opportunity to express our thanks to our colleagues, Dr. D. Roy, Dr. H. Taylor, and Dr. C. M. Gwillim, at St. George's Hospital, for their kindness in facilitating the supply of material and clinical details, and also to Miss A. Ratcliffe for valuable assistance in the laboratory.

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Clinical and Laboratory Notes.

A CASE OF PUERPERAL INFECTION DUE TO *B. AEROGENES CAPSULATUS*, SUCCESSFULLY TREATED BY THE USE OF WEINBERG ANTIGAS-GANGRENE SERUM.*

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I HAVE reported this case because, although this is fortunately a rare infection, it is usually a very fatal one, and I wish to point out the value of the early use of a powerful antitoxin, used in conjunction with the appropriate obstetrical treatment. In addition, I should like to emphasise the need for expert bacteriological reports in suspect cases. Animal experiment is almost obligatory in the absence of suitable anaerobic media. The guinea-pig is the more susceptible animal, but the rabbit is locally susceptible and can more usually be obtained.

A Case Related.

A woman, aged 28, was admitted as an emergency case to the Liverpool Maternity Hospital on June 18th, 1928.

History.—The patient was a healthy primigravida of 28. Her last period started on August 15th, 1927, and she expected on May 22nd, but labour did not begin until nearly a month later—viz., June 4th, 1928. The patient was under the care of a midwife and had had no medical antenatal examination. When pains started on June 14th, the midwife ruptured the membranes, and as there was no advance a doctor was called in, who advised waiting. Nothing further was done until four days later, June 18th, when the doctor was again sent for, and at midday attempted forceps delivery ineffectually. Numerous vaginal examinations had been made by the midwife. The patient was sent into hospital at 2.30 P.M.

On admission the temperature was 98° F., and the pulse-rate 128. The external measurements were good except for the outlet, which was 3 in. in the transverse diameter. The abdomen was very large, the presentation a vertex position right occipito-anterior, but the head was above the brim and could not be pushed in. No fœtal heart was heard. On vaginal examination there was an offensive putrid discharge, the cervix was three-quarters dilated and lacerated. The urine showed a thick cloud of albumin.

Treatment.—Under general anæsthesia the vault was perforated by Miss R. Nicholson, and a large dead, peeling infant extracted, weighing 9 lb. 11 oz., without the brain. It measured 22 in., and showed large centres of ossification in the lower end of the femur and upper end of the tibia.

Delivery was difficult; it was necessary to divide a clavicle in order to bring down the shoulders as the child was so large. Bilateral tears in the cervix and a tear in the perinæum were repaired and an intra-uterine douche was given and 0·5 c.cm. pituitrin and 1·0 c.cm. ergotin were injected, followed later by 30 c.cm. of antistreptococcal serum. In addition, at my request, as there was such a gangrenous odour, on the following morning 20 c.cm. Weinberg antigangrene serum and 20 c.cm. anti-*coli* serum, also from the Pasteur Institute, were given subcutaneously with saline. From the profuse offensive lochia Prof. J. M. Beattie, by inoculation of a rabbit, isolated *Bacillus aerogenes capsulatus*, and the presence of *Bacillus coli* was also reported. After an early rise of temperature (temp. 99·8° F.) there was no pyrexia, but the pulse-rate remained high (130), and the cervix, vagina, and perinæum were œdematous and gangrenous. The patient had a yellowish toxic appearance, but no definite jaundice. Hypertonic saline packs in the vagina were employed, and she gradually improved and made an almost complete recovery at a convalescent hospital, though the uterus remained high and somewhat fixed.

The *Bacillus aerogenes capsulatus* (Fraenkel's gas bacillus), *B. perfringens*, or *B. welchii* is a large anaerobic Gram-positive organism which normally inhabits the adult intestinal tract. Although rare in the intestine of the breast-fed infant it is frequently found in those artificially fed, and more especially in infants suffering from gastro-enteritis. As a rule it is a saprophyte and does not invade deeper tissues until shortly before death. Weinberg and Nasta found it in the pus in 30 per cent. of cases of appendicitis, and recent researches have demonstrated the frequent presence of the organism in the subjects of pernicious anæmia.[1] Williams[2] also showed evidence of the immense proliferation of the Welch bacillus in the small intestine of patients with acute obstruction and peritonitis with stasis, and used *B. welchii* serum with good effect in a series of such cases at St. Thomas's Hospital. I have used *B. welchii* serum myself in similar isolated cases, and in Paris it is used extensively prophylactically in abdominal infections.

The Experience of Others.

B. welchii is especially fatal to women who have had criminal abortion induced, and numerous observations have been published in Australian literature. Beare and Cleland[3] recorded a fatal case of *B. welchii* infection originating in the uterus of a married woman aged 42 years, following an induced abortion. *B. welchii* was recovered after death from the uterus, liver, and heart blood.[3] Its presence in the blood is not always shown by clear clinical evidence. It may occasionally disappear after a few days without giving rise to a true septicæmia. In septic abortions Bingold made (1915–23) 120 positive blood cultures.[4]

When the bacillus has traversed the intestinal lining and is in the circulation it may localise and develop in the subcutaneous tissue at the site of a capillary hæmorrhage provoked by the injection of some medicament or subcutaneous saline. Weinberg and Francon (1919) have seen a case of gas-gangrene

* Read before the North of England Obstetrical and Gynæcological Society on Feb. 22nd, 1929.

of both thighs in a typhoid patient where spartein and adrenalin had been injected.

Toombs and Michelson[5] have collected and classified 41 cases of gas infection, including one reported by themselves, and consider that most cases follow abortion. The most marked symptoms are pain in the abdomen, rise of temperature, rapid pulse, jaundice, hæmaturia, and secondary anæmia, with expulsion of gas from vagina, physometra, or surgical emphysema. They consider hysterectomy, antitoxin, and blood transfusion to be the most logical methods of treatment. Recovery took place in 13·16 per cent. of these cases, and in the majority hysterectomy had been performed. The need for immediate operation was emphasised by the fact that 10 per cent. died within 24 hours and one-third in 48 hours.

Cases of gas-gangrene of the uterus are occasionally described under the name of physometra. In 1922 Brutt[6] described six cases of this condition following abortion, all treated by abdominal hysterectomy, with one recovery. Dobbin[7] reported a case of puerperal sepsis due to infection with *B. aerogenes capsulatus*.

A patient with a generally contracted pelvis had been in labour for several days under a midwife. On admission to hospital she was profoundly infected and the head of a macerated child was firmly engaged in the superior strait, and the uterus was in a state of tetanic contraction. A fœtid dark-coloured discharge was escaping from the vagina with a crackling sound. Delivery was effected by craniotomy, and death occurred the next day. Within a few hours the patient's body had nearly doubled in size as the result of gas development. The gas bacillus was found in the fœtus and placenta, as well as in the lochia.

Little,[8] in 1905, reported ten cases in the Johns Hopkins Hospital. In only one case did the bacillus occur in pure culture, but was often associated with the streptococcus. Welch[9] pointed out that the association of another organism seems to augment the virulence, and I can strongly corroborate that statement from my own experience of gas-gangrene in war wounds. He suggested that the gas bubbles found in the blood-vessels of women supposed to have died from air embolism are frequently the product of this bacillus. Gebhard,[10] in 1895, demonstrated the presence of *B. coli communis* in seven cases of tympanites uteri. It was shown by Henry[11] that the toxic power of *B. aerogenes capsulatus* is due partly to its hæmolytic action and partly to a substance which has a special affinity for muscle. When a woman after labour or abortion shows a yellowish tint and reddish urine it is probable that she is suffering from a severe *B. welchii* infection which is rapidly destroying the red blood cells. In these cases the hæmolytic nature of the jaundice is shown by the fact that the patients show no bilirubin in blood, cerebro-spinal fluid, or urine, nor yet traces of bile-salts. Recording two cases of gas infections of the uterus with jaundice due to *B. welchii* following abortion under the care of Magarey, Magarey, Cleland, and Sleeman[12] state that since the year 1920 a series of fatal cases has occurred in which jaundice was usually a prominent sign. The downward progress of the patients was usually rapid, death occurring two or three days from the onset of uterine bleeding. They consider the condition to be one of the commonest causes of loss of life following abortion in Adelaide Hospital patients. The patients all aborted at an early period of pregnancy from the second to the fifth month. Interference was suspected. It seemed that the most likely explanation of the gas-forming bacteria reaching the interior of the uterus was by the introduction of fæcal specks at the end of some implement used for bringing on abortion, as the vulval hair and orifice must frequently be contaminated with bacteria of fæcal origin. If these are once lodged in the uterus an excellent nidus is found for their development. They considered the most pronounced clinical feature in these infections to be the apparent lack of realisation by the patient herself of the severity of her illness. In contra-distinction to the anxious and worried faces of the ordinary general peritonitis patient, these patients are calm and unruffled. They seem to be mentally numbed, though quite clear and intelligent. This I know to be strikingly true in the classic form of gas-gangrene when, with the onset of septicæmia as the case progresses to a fatal conclusion, there is often a lemon-yellow coloration of the skin, an increase in the pulse-rate, sweating, coldness of the extremities, subnormal temperature, copious hæmorrhagic vomiting, and dyspnœa. The patient talks naturally, may eat well, and is generally conscious almost to the end.

Nürnberger[13] considers that local infection yields to curettage, but extension to the musculature requires immediate hysterectomy and serum therapy.

Rôle of Anaerobes.

The rôle of anaerobes in wound infection has been worked out very thoroughly by Weinberg at the Pasteur Institute. During the war he was able to isolate a new organism, the *Bacillus œdematiens*,[14] and to prepare a mixed powerful triple-antitoxic serum against *B. perfringens*, *Vibrion septique*, and *B. œdematiens*. His treatise,[15] gives an exhaustive survey of his work. The latest Pasteur antigangrene serum is a mixture of serums and contains in addition to the three previously mentioned organisms, one part of anti-*sporagenes*, to which organism is often due the fetid smell of gas-gangrene, and one of anti-*histolyticus*, which is believed to contribute to the intoxication of the body as a whole. To this serum has recently been added a powerful anti-coli serum.[16] To avert anaphylactic phenomena the serum is best given subcutaneously, at the time of operation, diluted with saline solution, and while the patient is under the influence of the anæsthetic.

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AURICULAR FLUTTER AFTER DIPHTHERIA IN A CHILD.

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A BOY, aged 5, was admitted to the National Hospital for Diseases of the Heart on Sept. 28th, 1928, under the care of Dr. John Parkinson.

History.—Five weeks before admission he seemed ill and complained of his throat. His mother saw some white spots on the side of the throat, but the doctor said it was not diphtheria, and a swab was not taken. He was, however, kept in bed for two weeks, but on getting up he was so pale and tired that his mother brought him to the out-patient clinic.

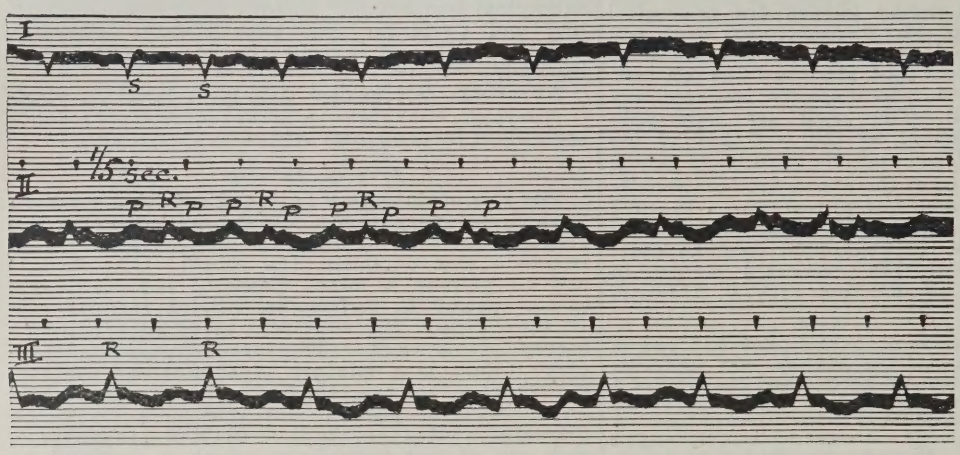
He was an only child, prematurely born (seven months), but of healthy parents. He always seemed frail and had scarlet fever, measles, and bronchitis, all within the previous year. There was no history of rheumatic fever or chorea.

Condition on Admission.—He was thin and strikingly pale. Weight, 33 lb.; height, 42 inches. The face seemed a little puffy, and this with a cloud of albumin in the urine gave a superficial resemblance to acute nephritis, but the

albuminuria cleared within a fortnight. There was no obvious dyspnœa, and no cyanosis, pulsation in the neck, or clubbing of the fingers. The heart rate was about 160 a minute on auscultation and irregular in rhythm—e.g., 30 regular beats, then a few irregular beats, then again 30 regular beats, and so on. The blood pressure was 105 mm. Hg systolic and 70 mm. diastolic. The apex-beat was in the fourth left interspace, just within the nipple line. No thrill was felt. On auscultation there was well-marked triple rhythm, apparently a duplicated first sound followed by the second sound. No murmurs were heard. The liver could be felt enlarged for about two inches below the right costal margin. The spleen was just palapble. There was no œdema and no ascites.

An orthodiagram showed enlargement of the heart (Fig. 4). An electrocardiogram taken on the day of admission showed auricular flutter with an auricular rate of 330 per minute and 2 : 1 block. In addition there was some left ventricular preponderance (Fig. 1).

FIG. 1.



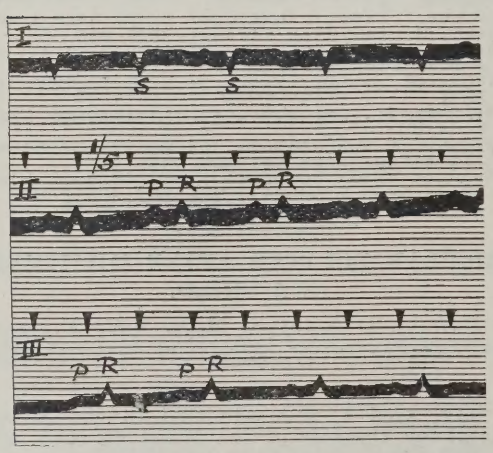
Electrocardiogram taken on admission, showing auricular flutter: A. 330, V. 165.

Course of Illness.—During the next few days in hospital the ward-sister noticed that he had a nasal voice. Examination of the nervous system then showed paralysis of both external recti muscles, so that lateral fixation produced squinting. The palate was paralysed, remaining immobile on phonation. The patellar and ankle tendon reflexes could not be elicited. The arm and abdominal reflexes were easily obtained and there was a double flexor plantar response. No sensory change was found. Nasal and tonsillar swabs proved negative for Klebs-Löffler bacilli. At the same time a Schick test gave a faintly positive reaction within 24 hours. The Wassermann reaction of the blood was negative. Some movement in the palate with complete recovery from the ocular palsy and return of the leg reflexes were noted in the sixth week in hospital—i.e., some 11 weeks after the so-called tonsillitis. The diagnosis of post-diphtheritic paralysis was thus confirmed.

On the third day in hospital, though the ventricular rate was still 160, an electrocardiogram showed normal rhythm (Fig. 2). During his subsequent stay in hospital repeated electrocardiograms never showed a return of auricular flutter. At the end of the first week his apex rate was 150, and triple rhythm persisted; the liver was smaller and the spleen no longer palpable. In the third week the rate had fallen to 120 and the liver was no longer palpable. Subsequently the heart rate fell to from 110–100, and remained at this level (Fig. 3). In the eighth week a modification of the first sound at the base merely suggested duplication. Twelve weeks after the disappearance of flutter he was up and about the ward, free from signs and apparently well. An orthodiagram now showed a heart of normal size (Fig. 4).

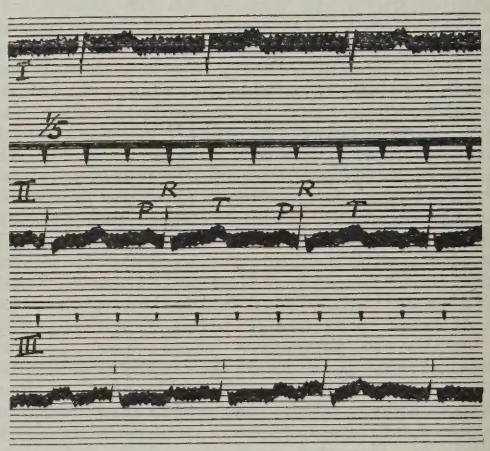
Dr. D. Evan Bedford has kindly furnished the following measurements from the original orthodiagrams. Fig. 4 (A): Oct. 8th, 1928, total transverse diameter (T.D.), 10·1 cm., area of frontal silhouette (area) 72 sq. cm., and cardiothoracic ratio 57 per cent. Fig. 4 (B): Jan. 4th, 1929, T.D., 7·9 cm., area 52 sq. cm., cardiothoracic ratio 47 per cent.

FIG. 2.



Electrocardiogram taken three days after admission, showing normal rhythm with simple tachycardia at a rate of 160 a minute.

FIG. 3.



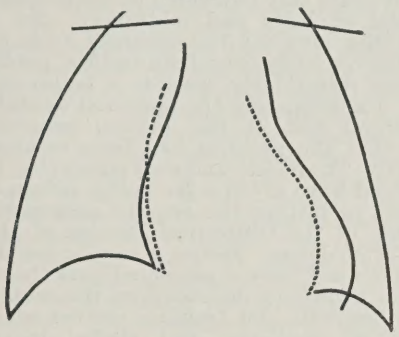
Electrocardiogram taken eight weeks after admission, showing normal rhythm at a lower rate (100).

Treatment.—The return to normal rhythm took place without the use of any drugs whatsoever, but he was kept strictly in bed for ten weeks.

Flutter in childhood, even apart from diphtheria, is rare. In the records at the National Hospital for Diseases of the Heart no case can be found in a child so young as here described. In the series of 50 cases of flutter published by Parkinson and Bedford [1] the youngest was aged 12. Poynton and Wyllie [2] have recently recorded a case of paroxysmal flutter in a

child observed from the age of 4 months to 3½ years, and whose electrocardiogram in an attack shows 1 : 1 flutter. Interesting and proved cases are also recorded by Lewis [3] and by Amberg and Willius,[4] the latter in a child with congenital heart disease. Speaking of the cardiac complications of diphtheria, Smith [5] says "of 242 patients (under his own care) the vast majority presented a rapid heart rate . . .

FIG. 4.



Orthodiagrams: (A) Continuous outline = on admission. (B) Interrupted line = 12 weeks after admission, showing smaller cardiac outline with recovery.

the initial tachycardia varied from 135–172." As other sequelæ he reports with electrocardiographic records, sinus arrhythmia, premature contractions, and heart-block. In his series there occurred neither paroxysmal tachycardia nor auricular flutter. Hume,[6] Bie and Schwensen,[7] and Schwensen,[8] report probable but not proved cases of flutter occurring after diphtheria. Smith [9] has published a unique case with a record taken at the moment of death in a child aged 4 with diphtheria, showing successively tachycardia, ventricular flutter, fibrillation, and heart-block.

Even paroxysmal tachycardia as a sequel of diphtheria is a rarity. Hume [6] reports a case with polygrams, and Marvin and Buckley [10] a case of ventricular paroxysmal tachycardia. Apart again from diphtheria interesting cases of unknown ætiology have been published by Koplik [11] and Hutchison and Parkinson [12] in children of an age ranging from 10 months to 10 years.

To summarise, a child of 5 years was seen five weeks after diphtheria with signs of heart failure. The electrocardiogram showed auricular flutter, which disappeared spontaneously within three days of admission. With the return of normal rhythm the same ventricular rate persisted for several days, and then fell quite gradually. Orthodiagrams showed a reduction in the size of the heart with recovery. No similar case of auricular flutter, confirmed by electrocardiogram, following diphtheria seems to have appeared in the literature.

My thanks are due to Dr. John Parkinson for permission to describe this case.

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Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS.

THIS Section held a joint meeting with the Maternity and Child Welfare Group of the Society of Medical Officers of Health on March 15th. The chair was taken by Dr. J. S. FAIRBAIRN, President of the Section, and Prof. J. MUNRO KERR opened a discussion on the

FUTURE OF THE MATERNITY SERVICES.

He pointed out that great advances had been made during the last decade in maternal and infant welfare. Antenatal supervision had definitely lessened the incidence and severity of obscure metabolic disturbances, and abnormalities in labour could be foreseen and thereby lessened in gravity. A large number of women became casualties because of faulty tactics in obstetrics, chiefly because of the difficulty of carrying out satisfactory tactics in domestic practice. Until quite recently the undergraduate had not received adequate practical instruction in midwifery, yet even the adequately trained undergraduate could not be regarded as a finished craftsman in obstetrics any more than in surgery. Nevertheless, the day after he was qualified he might be called upon to deal with a placenta prævia, though the public would never agree to his performing a major surgical operation. The trouble had arisen from the idea that parturition was an uncomplicated process, but often it was not, and in the simplest parturition there was a risk of sepsis. One grave abnormality alone—persistent occipito-posterior presentation—occurred in 20 per cent. of cases. The large body of practitioners did not want to engage in obstetric practice. Many had to undertake it because others did; they recognised it as a necessary evil which disorganised a crowded day's work. It was impossible for general practitioners in the middle of an influenza epidemic to give their obstetric cases proper attention. Their attitude was quite rational. All Prof. Kerr asked of the general practitioner was that he should allow those of his colleagues who were interested in obstetrics to modify domestic practice in such a way as to relieve him of the burden. The time was long past when the general practitioner could be a jack-of-all-trades. The future of domestic practice must lie in the direction of pure medicine, and the practitioner would only be enhanced in the eyes of the public thereby. The present high maternal and fœtal mortality and morbidity showed that domestic midwifery could not be satisfactory, and the reasons were: (1) the difficulty in securing surgical cleanliness; (2) the fact that midwives and nurses were expected to perform a number of domestic duties as well as attending to the patient; (3) the difficulty in securing adequate assistance if an operation became necessary; (4) the disturbance to the routine work of a busy practitioner, so that he was tempted to expedite delivery unnecessarily or prematurely; (5) the inadequate experience of practitioners in the craft of obstetrics now that 60–70 per cent. of the work had passed into the hands of midwives.

The Proposed Remedy.

Prof. Kerr suggested two forms of obstetric service, one mainly institutional and the other largely domestic. There should be, he thought, enough beds for all primiparæ, for all multiparæ whose labour was likely to be complicated, and for antenatal cases. The remaining normal multiparæ might be attended at home by midwives. A large number of patients might be transported to hospital by ambulance as soon as labour started and sent home again in the same way after three or four days. The fate of the parturient was sealed in the labour ward, and if all was well three or four days afterwards she could safely

go home. This was not suggested as ideal, but as an expedient to get over the difficulty of inadequate hospital accommodation. Obstetric beds should be concentrated in most carefully selected centres, which should be as few as possible, and should be in the hands of obstetric specialists. The alternative scheme would be to have a domestic obstetric service supplied by specialists, but it was very doubtful whether this would be as satisfactory. For a town like Glasgow and its environs about eight or ten obstetric specialists would be required. They would supervise the work of the midwives, which would serve to keep their work up to the standard inculcated during their training. Any scheme demanded the support of all branches of the profession and financial aid from the Government and local authorities. If, however, the doctors concerned did their part without bitterness the necessary money would be forthcoming. The public should realise that there would always be an irreducible minimum of casualties; puerperal infection could never be absolutely stamped out and there would always be minor accidents.

The General Practitioner's Part in the Scheme.

Dr. J. J. BUCHAN said that in his opinion the general practitioner was a very potent factor in public health—the outlying scout who saw early defects in health—and he would be very sorry to see him divorced from the same kind of work in midwifery. Child-bearing was a strictly physiological function and the danger involved should be very small. That it was not so was due to three things: (1) the number of women who were unfit for the ordeal of maternity because of defects in their health or development; (2) the want of knowledge or the failure to seek advice and help, especially early in pregnancy; (3) the want of facilities for advice and treatment. These were in order of importance; the first was by far the largest factor, and in the future an increasing amount of care and attention would be paid to the hygiene and development of girls. The cause of difficult maternity was in many cases to be found early in the life of the individual, and ought to be mitigated before any question of maternity arose. A certificate of fitness for marriage seemed to be involved, and it was certainly an important question how far the public might interfere to prevent the birth of diseased offspring. It was most important that the public, especially women, should know about the maternity service, and information should not be confined to the pregnant alone. Our insurance system had failed to appreciate the experience of Germany that benefits in kind were more helpful than benefits in cash. It would be of the greatest value if part at least of the maternity benefit could take the form of maternity service. The requirements of each locality must be considered separately. In industrial districts the midwife was perhaps the most important unit in the maternity service. She was a health officer; her duties were to observe and supervise normal conditions, and her duties to abnormal conditions ceased when she had recognised them and called in a medical attendant. Thereafter her duties as a nurse might begin in carrying out the doctor's instructions. She ought not to be at liberty to prescribe any drug or carry out any procedure for the correction of abnormality. Even the doctor should regard his duty as primarily hygienic, and only interfere if interference were unavoidable. Owing to the increased use of the midwife the doctor was apt only to be called in to abnormal cases, and to come to regard all midwifery as abnormal. Progress would be through development of the work of the midwife and the ordinary practitioner, not that of the specialist. In all public health activities it was the little common things that mattered, and these the midwife and general practitioner observed. Every pregnant woman, however, should be brought into touch, as early in pregnancy as possible, with the obstetric specialist—through the antenatal clinic, for instance—and the specialist must be a real part of the service, linking up all the others. Finally, without adequate hospital accommodation no service could be regarded as effective.

Mr. EARDLEY HOLLAND said that although institutional midwifery would be the midwifery of the future, we must in the meantime depend on the general practitioner and midwife. The standard of a maternity service depended essentially on a midwifery tradition, and in this country a great midwifery tradition did not exist. It must be inculcated in the medical public, whence it would spread to the general public. It could only be created by the proper training of medical students and midwives. Mr. Eardley Holland then reviewed the advances made since the war by the obstetric specialists and the public health authorities respectively towards a better midwifery service. Unfortunately the maternal mortality-rate, the essential test of the service, remained high, proving that the problem had been tackled in the wrong way. The money and man power that had been spent would have given a far better return if it had been used to further the reforms suggested by the committee of the Obstetrical Section of the Royal Society of Medicine. Before a service could become effective it must have a personnel, and the salvation of British midwifery depended on the establishment of large hospitals and training centres with a high standard of excellence, and staffed by obstetric specialists. These should have outposts staffed by junior specialists, and should serve a wide area by means of a good ambulance and telephone service. Every maternity hospital was dangerous unless it had three divisions: one for clean booked cases, a smaller one for emergency cases, any one of which was potentially a puerperal infection, and a still smaller division for frankly septic cases arising in hospital. A great deal of the puerperal infection arising in small maternity hospitals was due to mixing emergency cases with clean ones. The time would come when very few general practitioners would do midwifery. If these large centres were established they would provide a large number of young men highly trained in midwifery, and the public would learn to seek these practitioners for confinements. Any person who had charge of patients during pregnancy ought to be responsible for them during labour. The country had gone mad on antenatal work, and much of it was utterly irresponsible.

The Midwife and the "Handy-woman."

Dr. EUSTACE HILL did not agree that most general practitioners had no desire to practise midwifery. Many obstetric specialists were apt to take too narrow a view of the midwifery service problem and to forget the country district where, even with cars, it would be quite impossible to get a consultant to the patient until the need for his services had passed. Antenatal clinics were in their infancy and imperfect, but a proper antenatal service must be of great advantage to the community, and must provide the most expert obstetric opinion. He advised the following measures: (1) Improvement of the status of the midwife; the standard of education, the salary, the transport, and the holidays were all inadequate. The midwife should be a trained nurse with 12 months' special obstetric experience or else the period of training must be prolonged, perhaps by some system of post-certificate work under supervision. (2) Development of antenatal centres on the right lines. (3) Adequate bed provision in maternity hospitals or homes. (4) Adequate specific provision for sepsis. (5) Elimination of the untrained midwife or handy-woman. (6) Improved education of the medical student. (7) Alteration in the powers of the Central Midwives Board. The handy-woman was tacitly acknowledged by many doctors. It should be a sine qua non of maternity benefit that the woman should engage either a doctor or a qualified midwife, one of whom must undertake the confinement. It had been shown that a good maternity service of midwives could secure a maternal mortality-rate one-fifth that of the sparsely populated district where midwives were not available.

Discussion.

The PRESIDENT said that the great objection to domiciliary midwifery was the pressure brought to bear on the doctor by patient and relatives to end labour. The country was rapidly being urbanised, and it was therefore best to make a scheme first for the more populated areas.

Lady BARRETT suggested that certain measures might be taken at the moment to enable the general practitioner to do his work with greater facility and satisfaction. Every patient should employ a qualified midwife, even though she had a doctor as well, because it was quite impossible for the busy practitioner to give the time that the best midwifery required for letting things go on quietly under careful observation. The provision of a midwife for every case would soon do away with hurried midwifery and bring about coöperation. It might be possible for the midwife to give an anæsthetic in the later stages when the doctor was present. At the outside, the medical student had three months' training in midwifery, yet the young doctor was expected to go to the aid of a midwife who had spent 12 months training in midwifery. It was possible that we still had altogether too low a standard for the obstetric education of the doctor. The consultant service should also be extended to cover all difficulties in labour so that no doctor, however poor his patient, need hesitate to call in expert advice. All puerperal fever should be treated by obstetric specialists, and not in fever hospitals.

Dame LOUISE MCILROY brought forward the patient's point of view, and suggested that few women would care to be taken back to all the problems of their homes four days after their labour. She agreed that the future of the midwifery service lay very largely in the hands of the general practitioner, and that coöperation between doctor and midwife was very valuable. She was convinced that many deaths were due to the shock of the very painful process of labour without any sedative; were midwives, therefore, to be allowed to give sedatives and anæsthetics? She did not see how it was possible to have too much antenatal work. Where possible there should be a panel of general practitioners showing special interest or aptitude for midwifery to run antenatal clinics and follow up their cases. The Registrar-General's puerperal mortality figures ought to be analysed; they included, for instance, cases of pneumonia during the parturient period, although the woman's pelvic organs might have been perfectly normal. Antenatal cases ought not to be in the same ward with puerperal ones. A case of *Bacillus coli* infection would cause puerperal temperatures in that ward for several weeks afterwards. The obstetrician ought to treat all his own cases of sepsis; to teach students what sepsis was would teach them its prevention. Obstetric specialists were sometimes very unfair in their criticism of the general practitioner; they had done little to improve his position. Too often midwifery was taught by house surgeons or junior officers, while the chief only attended for occasional major operations.

Mr. W. S. A. GRIFFITH said that after 55 years' experience of midwifery he still held that the essential crux of the problem was the education of the doctor and midwife, and there was a crying need for its improvement. The cure for the "handy-woman" had been provided by the General Medical Council's notice about covering. At present only a small proportion of the trained midwives practised midwifery, because the prospects of reasonable pay and comfort were very small.

Dr. W. H. OXLEY said there was an enormous need for improvement in the training of students in practical midwifery, and it was marvellous how men learned in private practice to deal with the obstetric difficulties they encountered. The real obstetric specialists of the country were the general practitioners. It was a general practitioner who had taught in the middle of last century that diagnosis should be made abdominally and that vaginal examinations were undesirable. It was a general practitioner—the late Dr. Cursham Horner—who had inaugurated antenatal work on a large scale 15 years before Ballantyne. It was a general practitioner who had first drawn attention to the grave dangers of puerperal fever carried by droplet infection. Nothing whatever had been done by the obstetric specialists until the report of the Ministry of Health had alarmed the country. The amount of good work private practitioners did under vile conditions, and with no training, was surprising. He agreed with Dr. Hill's recommendations, but thought the only practical solution was an insurance maternity service, requiring a midwife for every case, a doctor for every emergency, subsidised hospital beds, and consultants for difficult cases. It would be wrong to provide a lot of hospital beds for normal cases. A halfpenny per week per insured person would supply all the funds necessary.

Dr. STELLA CHURCHILL said she would be sorry to see an extension of the National Health Insurance Act, as it would give more scope to the general practitioner without improving his training or results.

Sir EWEN MACLEAN said there was a tendency for people who did not know the difficulties of the obstetricians to bring railing accusations against them. Many midwives rendered excellent service, and anything that improved their training was all to the good. but in practice it was not always easy. In country districts the regulations of the Central Midwives Board were often disregarded, and there were still many handy-women prepared to attend a lying-in or a laying-out with equal zest. The ideal scheme was to have midwifery beds in direct association with the antenatal clinics of the local authority. The first and only practicable contribution to a maternity service was going to come from the further development of the insurance system. The general practitioner was the first line of defence, and his interests must be safeguarded if any scheme was to come to fruition.

The PRESIDENT recommended to those who depreciated the activities of obstetricians a perusal of the Transactions of the Obstetrical Society and of the Proceedings of that Section. Nearly all the recent enactments had been foreshadowed there.

Prof. MONRO KERR, in reply, remarked that the two greatest contributions ever made to the progress of practical medicine had been made by obstetricians—Semmelweiss and Simpson.

Dr. HILL, in reply, said that the difficulties of getting evidence against the handy-woman had proved insuperable in nine cases out of ten. No local pressure would eliminate her. The only way of arranging antenatal work in rural districts was for the general practitioner to do it; he was well able to undertake it, for the best men in the profession were the practitioners in scattered rural areas.

LIVERPOOL MEDICAL INSTITUTION.

AT a pathological meeting of this institution on Feb. 17th Dr. M. DATNOW read a paper on the

Effects of Lead on the Tissues.

After a brief historical review of lead poisoning he gave an account of experimental work carried out for the Liverpool Medical Research Organisation. The animal used was the rabbit, and the chief lead preparations used were the phosphate, aspartate, glutamate, hippurate, malate, iodobenzoate, and the benzoyl aspartate, in colloidal suspension containing 0·5 per cent. of lead. The lead colloid was introduced by intravenous injection. Dr. Datnow said that as the liver—with the possible exception of the spleen—was the main organ concerned in taking up lead from the blood stream, it was also the organ which first showed pathological changes. With massive doses or with very toxic preparations—e.g., 10 c.cm. of lead malate or 5 c.cm. of the more toxic benzoyl aspartate—extensive hæmorrhage was found throughout the liver substance. With therapeutic doses there was only transient cloudy swelling which

cleared up in 24 hours. This was confirmed by liver function tests and by clinical observations. Intermediate doses produced extreme dilatation of the capillaries with compression of the liver cells; the zone of the central vein was first affected. Similar changes were observed in the kidney. In the heart muscle apart from hæmorrhages with lethal doses no definite pathological changes were found. The spleen showed increased pigment with dilatation and congestion of the sinuses. Dr. Datnow also briefly mentioned the selective choriotropic effect of lead first pointed out by Blair Bell. He concluded by describing the effects of lead on rat tumours (Flexner rat carcinoma and sarcoma), demonstrating the destruction of the malignant cells with increased fibrosis in the tumours after treatment with lead aspartate.

HARVEIAN SOCIETY.

At a meeting of this Society on March 14th, held at the Paddington Town Hall, Dr. GRAHAM LITTLE, M.P. for the University of London, delivered the Harveian Lecture on

THE MEDICAL PROFESSION, THE VOLUNTARY HOSPITALS, AND THE DE-RATING BILL.

He said: This Bill, officially known as the Local Government Bill, is likely to bring the most drastic changes in our hospitals, in all the health services of the country, and in the actual exercise of the profession by the individual members of it. The Bill has two main purposes. First, the introduction of changes in the local government of this country, rendered necessary by the redistribution of the population and other causes in the century which has elapsed since the present system of poor-law administration was inaugurated—that is, 1834. The second purpose, the relief of rates, in a number of industries which are called "productive industries." The first purpose is obviously the more important, inasmuch as the Ministry of Health has been entrusted with the whole Bill, and it is this part of it that will be considered.

The Bill transfers the poor-law administration from the boards of guardians to the county councils and county boroughs, but the provisions of the Poor Law Act of 1927 are retained. It is a change of administration rather than a change of principle. The importance of the change to the medical profession lies chiefly in the power and even the encouragement given to the new county councils and county boroughs to provide hospitals and maternity homes, and the consequent probability of competition resulting between these new municipal hospitals and the voluntary hospitals already in existence has given rise to much uneasiness, very obvious in the debate in the House of Lords just concluded. Amendments proposed both in the House of Commons and in the House of Lords to provide some machinery for securing coöperation of the new municipal hospitals with the old voluntary hospitals, and so avoiding competition and overlapping, have been refused on the part of the Government, and it is true to say that at present there is no real check provided by the Bill to prevent that competition. The retention by the Minister of the complete control of all medical (and other) officers under this scheme makes a still wider extension of the medical autocracy of the Minister, already conferred by the National Health Insurance Act. About half of the entire medical profession in this country operates that Act at the present time. The medical staffs of the new municipal hospitals will also be under the control of the Ministry of Health. The Minister makes no secret of the desire of the Ministry, not as yet achieved, to extend the health services so as to include not merely the destitute but the sick, and thus foreshadows a nationalisation of the whole of the medical services in this country. A further extension of the power of the Ministry follows upon the changes in the relationship between the Exchequer and local bodies. The substitution of block grants for the percentage grants hitherto made to local bodies further increases the power of the Minister, for he reserves complete control of these grants, he may vary or modify them as he will.

The necessity, Dr. Graham Little continues, for providing further institutional treatment than the voluntary hospitals are able to supply in their present condition of development is conceded, but the means adopted for supplying this treatment may be questioned. The voluntary hospitals have been unable to meet the demands upon them because they have become so popular, and their funds have not allowed them to meet the demand as quickly as the public desire. The prestige of the voluntary hospitals explains why patients are willing to wait for admission to those institutions rather than to seek admission at the poor-law hospitals already in existence. There is no guarantee that patients will not still prefer to wait for admission at the voluntary hospitals. Government Departments cannot create prestige or personnel. A more logical and certainly a far more economical solution of adjusting the difficulty of empty beds at the poor-law hospitals and over-full beds at the voluntary hospitals would seem to be the provision of beds at those institutions where the demand is greatest. That provision could be made at a far smaller cost than would be entailed by starting new hospitals, and all the voluntary hospitals are, in point of fact, extending their accommodation as fast as funds will allow them to do so. Laboratories and special departments, which constitute so large an expense of hospitals, are already there, at the voluntary hospitals, and the consequent extra expenditure would be little more than the actual costs of providing new beds with a slight addition for the increase of the medical staff. The Ministry of Health, however, has determined upon the much more expensive and perhaps more dubious expedient of encouraging the establishment of quite new hospitals, and no provision whatever has been made to prevent competition with existing hospitals in each area.

During the last decade the voluntary hospitals throughout London and the country have become largely self-supporting institutions, and the voluntary system has developed into a great coöperative system of insurance, voluntary in character but growing rapidly to include quite new sections of the population. There is now an additional effort in progress to include certain sections of the middle classes. In these circumstances it is quite possible that the voluntary hospitals may elect to remain independent and to continue as they are now, outside the orbit of operation of the Ministry of Health, at any rate as regards their management. They would probably continue to attract, as they have in the past, the services, both lay and medical, of the best men and women of their time. Under modern conditions of medical practice the training of specialists who form the staffs of voluntary hospitals for the most part entails so many years of preparation that the supply is strictly limited. It would be quite impossible to staff the new municipal hospitals with officers of the same status as those who staff the voluntary hospitals without drawing upon the personnel of the voluntary hospitals. It is the freedom and elasticity of the voluntary system which has attracted such a high quality of service, both lay and medical. The importance of preserving this service seems paramount, but cannot be achieved without preserving freedom, especially freedom from departmental control. It would be entirely possible to blend the proposed new institutions with the old if a measure of freedom were retained. A central advisory body could be constituted to guide and coördinate health services throughout the country, this advisory body to be comprised of representatives of the County Councils, of the Ministry of Health, and the voluntary hospitals. In London the body representing the hospitals

might well be King Edward's Hospital Fund; in the provinces the body representing the hospitals is less obvious, but might be drawn from the Voluntary Hospitals Commission, or as Sir Arthur Stanley proposes in a recent letter to the *Times*, the Regional Committees of the British Hospitals Association. It is submitted that to keep the voluntary system intact in both lay and professional fields the representation of the voluntary hospitals must be predominant in this advisory council. The nearer the new hospitals approach to the atmosphere and practice of the voluntary hospitals the more probable is their ultimate success, in securing the confidence of patients, in maintaining economy and efficiency, and in winning the wholehearted and enthusiastic coöperation of the medical profession, upon which the success of any health scheme must ultimately rest.

Reviews and Notices of Books.

The Chemistry of Chemotherapy.

By G. Malcolm Dyson, Ph.D., Research Biochemist to the Laboratory of Applied Pathology and Preventive Medicine, Manchester. London: Ernest Benn, Ltd. 1928. Pp. 272. 32*s*. 6*d*.

This volume appears to be largely a summary of the well-known works on the subject, such as Fraenkel's "Die Arzneimittelsynthese." The writer sets about his task of writing the book in a somewhat patronising spirit. For instance, in the preface he says, "Details of symptoms have been omitted as far as is possible, and no references have been made to chemical details of synthesis and production, since this book is intended for the 'plain chemist' (if there be any such left!) rather than for the expert pharmacologist or for the 'compound maker.'" Quite early in the book Mr. Dyson expresses his opinion of the medical type of investigator; he says: "A third difficulty which could, possibly, be more easily removed, is the looseness of thought and even of experimental technique found widely among investigators in physiological, pathological, and pharmacological laboratories, leading often to generalisations based on insufficient evidence, often upon no real evidence at all. This has caused several especial difficulties which are met with in a critical survey of work done upon the subject of the action of drugs." This somewhat disdainful condemnation of his fellow-workers is not justified.

The first chapter of the book is entitled Physiological Action and the Nature of Matter. Here Mr. Dyson shows some lack of familiarity with physiological and pathological nomenclature. He was unfortunate, for example, in his choice of the term enzyme in the first paragraph, when he refers to the two classes of protective substances—first, the externally synthesised substances produced by the chemotherapeutist in the laboratory, "in contradistinction to the various substances *of the enzyme class* (our italics) which the animal is able to synthesise within itself as a defence organisation against bacterial invasion." On page 17 we get another reference to enzymes, where the author says: "The whole trend of the study of enzymes and their activities leads to the conclusion that their specificity—the 'lock and key' action of Fischer—rests finally upon the electronic nature of the molecular constitution, and that whilst their structural formulæ (in the conventional chemical sense) may reveal nothing concerning the reasons for their specific action, the energy relations of the ultimate particles which make up their molecules are the agents responsible for the development of specific activity." So much for the speculative and reflective part of the book. The sections on chemotherapeutics are clearly arranged, the substances being grouped according to their chemical constitution. Thus the compounds of carbon, oxygen, and hydrogen are dealt with in the second chapter; the third being devoted to the halogen derivatives. Chapters IV. to VIII. are wholly given up to the study of the simple and more complex compounds of nitrogen. The compounds of sulphur, selenium, and tellurium, and the organometallic compounds are respectively the subjects of the last two chapters. In each case the structural formula is given, together with a few details of the chemical properties of the substance in question and a summary of the pharmacological action, the minimum lethal dose of practically all the compounds being included. The author deserves praise for his method of expressing the minimum lethal dose. In one formula he gives the animal used, the amount of the drug per kg. used, and the method of administration. It is to be hoped that other writers will follow this pattern of expression.

The place of the volume in the literature is not easy to assess. It does not contain enough information to make it complete in itself, whilst it is really too big to be used merely as a text-book. It shows evidence of much hard work. The information collected is accurate and a really good bibliography is appended.

Common Colds.

Cause and Preventive Measures. By Leonard Hill, M.B., F.R.S., Hon. A.R.I.B.A.; and Mark Clement. London: William Heinemann, Ltd. 1929. Pp. 126. 6*s*.

"To inform a patient" say the authors of this little work "that he is suffering from a 'catarrhal cold' is to tell him what Hippocrates might have told him 400 years B.C. . . . Such a diagnosis has some historical importance, but it has little scientific value." It is the word "cold" to which the authors particularly object, and the experiences of Nansen, the Tierra del Fuegeans, balloonists, and Dr. Chodounsky, who stood naked before his window at 0° C. for 55 minutes, and not only failed to catch cold, but cured his rheumatism, are quoted in proof of the international fallacy of talking about catching cold.

Ventilation, an open-air life, and good food are stated to be the great enemies of the cold. The kiss has a small section; "If a kiss has to be given, let it be on the forehead, or the neck." The pollution of the air by smoke, the perambulation of the infected, the abuse of alcohol and tobacco, are all included in the ætiological retinue of the common cold. In fact, to use a rather homely but appropriate phrase, it would seem to be a whole-time job to avoid catching a cold—a sentiment with which the reader's experience will concur.

A vast amount of somewhat ill-arranged information about colds is assembled in this book, but it fails to obscure the sad fact that we do not know what a cold is or how to cure it. The bacteriology of the cold is the bacteriology of the normal respiratory tract thrown out of proportion. The transmission of colds by filtered exudates from the throat of a patient would seem to suggest a filter-passing virus save that we do not know what such viruses are, and the suspicion that bacteria may have filterable phases in their life-history is shared by a number of workers. Vaccine prophylaxis is fully considered. Results are proverbially variable and often disappointing. In a closed or partly closed community, a vaccine prepared from representative and parochial colds is often efficient. But the average man, whose embraces are not always on forehead or neck, and whose places of business and methods of transit fall far short of the spartan conditions enjoyed by Dr. Chodounsky, must needs encounter bacterial enormities which the most polyvalent vaccine has not foreseen. The polyvalent vaccine is, in fact, the prophylaxis of Goliath; there is always a joint in the armour. And it is possible to argue that vaccines protect not against colds, but against their sequelæ.

It is a little disappointing to find that one of the shortest chapters in the book is that on treatment,

and that the reader will probably find his favourite cure relegated to "old-fashioned methods." But the authors, of course, are chiefly concerned with preventing colds. And, if the reader will conscientiously carry out all the advice here given on preventing colds, he will be far too busy to notice his cold when he contracts it.

HOSPITALS AND THE STATE.

A Popular Study of the Principles and Practice of Charity. By R. WESTLAND CHALMERS, M.B. London: John Bale, Sons and Danielsson. 1929. Pp. 143. 6*s*.

Dr. Westland Chalmers surveys private philanthropy and the growth of a public conscience in hospital matters in England, with due note of well-known landmarks such as the Black Death, the suppression of the monasteries, the Elizabethan poor relief statute, Dickens's novels, and the National Insurance Act of 1911. He gives full credit to the voluntary hospitals, but he finds voluntaryism precariously kept alive by an intensively stimulated charity, attacked by many difficulties of which the main root is finance, and unequal to the task of the extension of institutional agencies necessary for the prompt detection and cure of disease. Only the State, he believes, can perform this task by extending statutory hospitals of a specialist character; the present overlapping and competitive methods, he thinks, must give way to a systematic policy on the lines proposed by the 1920 Coördination Scheme of the Medical Consultative Council, otherwise known as the Dawson Report. Lord Dawson's more recent observations (on the second reading of the Local Government Bill) regarding the "official doctor" are a further warning. The book is written vigorously but with occasional lapses as when the Great Fire of London is said to have "decimated" 436 acres within the City walls. Compiled just too soon to address itself to the concrete proposals of the new local government legislation, it is nevertheless timely in its estimate of the future of State intervention based on past history.

MEDICAL ADVENTURE.

By ERNEST WARD, M.D., F.R.C.S. London: John Bale, Sons and Danielsson, Ltd. 1929. Pp. 291. 8*s*. 6*d*.

MEDICAL adventure is the well-chosen title of a remarkable book. It is a record, freely annotated, of a man with a rich experience of many sides of a doctor's life. The author has served his apprenticeship as a general practitioner, as an expert witness in medico-legal cases, and as a unit in the administration of the tuberculosis service. In each of these spheres he has shown a chameleon-like fidelity in adjusting himself to his surroundings; as a general practitioner he has had "close-up" glimpses of humanity at its best and worst; as an expert witness he has revelled in those gladiatorial joys and spectacles which the law-courts offer every day free of charge (to the spectator); and as an administrator he has acquired that atmosphere with which even those of us who are left without the pale are so intimately and sometimes painfully familiar. The author is quite at his best in the first parts of his book. Here he gives us one anecdote after another, flavoured with caustic humour, illuminating the pitfalls awaiting the unwary practitioner. Many of his anecdotes illustrate problems in obstetrics and should prove most useful as well as entertaining to young practitioners. This is not the place in which to steal much of Dr. Ward's thunder, but it may perhaps be permitted to quote him on the prolonged disability which may follow even uncomplicated fractures of the ankle. "The editor of a leading medical journal once told me that he fractured his ankle 30, or it might be 40, years ago and that it still felt 'like a testicle.' A little tender, I gathered, when he trod firmly upon it." One of the many useful lessons the author teaches as a former expert witness is the wisdom of being modest. He has both the courage and the modesty to tell stories against himself in the witness-box. In this critical age few are impressed, while many are irritated, by the medical expert who poses in the witness-box with a magisterial air and with the expression of an omniscient divinity. Were it not for the wealth of technical detail in this book, it would make excellent reading for the layman as well as for the doctor. Perhaps the author will one day bring out an edition adapted for this purpose. It should have a great success.

GENERAL MEDICINE.

Ergebnisse der Gesamten Medizin. By numerous contributors. Under the general editorship of Prof. BRUGSCH, Director of the Medical Clinic of the University of Halle. Berlin: Urban and Schwarzenberg. Vol. XII. Part II. 1928. Pp. 340. M.35.

THIS volume is the most recent of the series of the large modern publications under the above title. There are eight original articles in it on clinical and scientific medicine. The subject of the heart and circulation during sport and gymnastics is continued from Volume X. A really important contribution on radiotherapy in disorders of the thyroid gland includes biological considerations, the particular technique of the treatment of Graves's disease with radium and X rays, the therapeutic measures available in the rarer thyroid maladies, and a complete modern bibliography. The early diagnosis of phthisis by radiology is another subject dealt with exhaustively and illustrated by many good reproductions of skiagrams. Perhaps the most important article of the eight is the one on the pathology of rickets. This contains a review of the status of the disease in the light of modern vitamin research with particular reference to the place of activation of the pro-vitamins and the isolation of vitamin D. The subject matter is fortified with tables showing the broad relationships between latitude, sunshine, climate, season, and rickets. The chemical and nutritional aspects of rickets are fully summarised with a review of the experimental production of the disease. But the author's main concern is with the activation of the pro-vitamins and the identity of vitamin D. There is nothing new in a lengthy article on Hodgkin's disease but it is well amplified by charts and photographs. Other articles include one on primary glaucoma with special reference to treatment, another on bile-pigments and the chemistry of icterus, and another on the biological aspects of colloid chemistry.

DISEASES OF INFANTS AND CHILDREN.

Sixth edition. By H. D. CHAPIN, M.D., Emeritus Professor of Diseases of Children, New York Post-Graduate Hospital; and L. T. ROYSTER, M.D., Professor of Pediatrics, University of Virginia. London: Baillière, Tindall and Cox. 1928. Pp. 675. 30*s*.

TWENTY years have elapsed since the publication of this book in its original form by Prof. Chapin and the late Dr. Pisek, and the appearance of six editions in this period bears witness to its continued popularity. The new volume is slightly larger than its predecessors; it contains numerous minor additions, while the authors' original intention of describing diseases in a condensed form has been adhered to. The distribution of space is somewhat uneven, feeding and diseases of infants being treated in much greater detail than are the disorders of childhood. An interesting feature is the authors' account of the treatment of epilepsy by ketogenic diet, by means of which they have obtained results which are distinctly encouraging.

The volume is well and fully illustrated, and is likely to prove as popular as the earlier editions.

THE LANCET.

LONDON: SATURDAY, MARCH 23, 1929.

SUN-WORSHIP.

TEN years ago it would have seemed as incredible that a simple article of diet would be found to cure pernicious anæmia, as that the controversy, then acute, centring round the causation of rickets, would be settled with honours easy. The first discovery has as yet no theoretical significance; it is an isolated piece of knowledge of immediate practical value. Of far greater import is the merger of the two contradictory conclusions about the ætiology of rickets. These conclusions were founded mainly on clinical observations, fiercely upheld, that rickets could be prevented and cured respectively by (1) the administration of cod-liver oil, (2) exposure to fresh air and sunlight. The curious explanation—namely, that the avitaminosis of which rickets is the manifestation is subject to dual control, forms a warning that widespread clinical impressions, even if they seem to conflict with one another, cannot safely be neglected. We summarise in another column the comments of the Medical Research Council on artificial light among the other therapeutic innovations reviewed in their report for 1927–28. It is good that the physiological bases so far established for such treatment should be clearly defined and that our deficient knowledge of the way in which light acts should not be masked by jargon. But the scepticism implicit in the report as to any effect of artificial sunlight other than the production of vitamin D or of a local inflammation in the skin has aroused protests from quarters which cannot be disregarded. The aspect of the subject first criticised, chiefly on economical grounds, is the tendency to choose ultra-violet light rather than foodstuffs rich in vitamin D for the prevention and cure of rickets. The physical method of treatment costs, according to the report, some 50 times more than the dietetic one. This point was well worth making in view of the vast expenditure incurred in the purchase of apparatus, and should be seriously considered by public bodies as well as by individuals. It must not be forgotten, however, that little is known of the mechanism whereby the vitamin promotes calcification. Certain children, for example, in whom there may be a defect in assimilation, are said to respond better to irradiation than to oral treatment. Moreover, the number of children suffering from minor degrees of fat indigestion is probably larger than is generally supposed. It is small points like these—very important although small—which must tell against the infallibility of general conclusions.

Interesting is the suggestion that in producing a local inflammatory reaction the artificial sunlight has no advantages over a mustard plaster, and we may here recall the existence of two distinct schools in light therapy. One set of observers do indeed challenge a comparison with earlier and simpler methods of producing hyperæmia, for their definite object is to cause an erythema, and they warn their patients that some degree of redness, swelling, tenderness, and subsequent peeling is to be anticipated. The other group regard such a reaction as a definite sign of over-stimulation and aim at sub-erythema dosage. This latter technique will be swept outside the realm of therapeutics if the future brings confirmation of the doubts expressed by the M.R.C. about the general beneficial effects of irradiation. But how exactly could these subjective effects be estimated? We cannot, for example, measure the exhilaration associated with a fine sunny day in basal metabolic or pulse-rates; it is surely independent of the movement of cold crisp air against the body surface, though stimulation may be enhanced by this contact. After a spell of cloudy weather, in summer as in winter, the appearance of the sun gives a pleasure, a relief from tension which is a common heritage of mankind. Tedious journeys undertaken by the rich in winter time, the grumbles of the people after a dull summer—it is unnecessary to reiterate the evidence of a real craving for sunshine, for none deny it. The point at issue is rather whether this craving can be satisfied, or somewhat satisfied, by artificial means. Many of the victims of the craving affirm that it can, and there is no more reason to doubt their subjective evidence than the impressions of their doctors. The brilliant artificial illumination now available in all civilised households has not been accepted as a substitute for sunlight, but the discovery that at least a few of the missing rays could be supplied from a new source naturally led to renewed experiments. A large number of people are convinced that irradiation appeases their longing for the sun in winter time and that it has definite tonic properties. What their need has been, and whether it will ultimately be expressed in terms of alteration in protoplasm or pigment, are still unknown. But because vitamin formation, pigmentation, and local inflammation are the only physiological changes as yet appreciable it is surely premature to infer that no others are derived from exposure to artificial sunlight. Experiments carried out by Dr. HELEN MACKAY in 1925 certainly appear to show that a belief in the general therapeutic value of ultra-violet light is unfounded—and confirmation of this comes from an experiment carried out on behalf of the Council by Dr. DORA COLEBROOK in the Willesden school area. The report of the M.R.C. points out that there are no published controlled experiments to set against these findings. That may be so, but there is a considerable body of clinical opinion in support of ultra-violet light, even though it is not supported by scientific evidence. And unfortunately scientific evidence in such a vague condition as general wellbeing must be difficult to obtain. Further, it is possible that other clinical observers might have drawn different conclusions from the experiments quoted, while the fact that in the experiments the "controls" were found to be less prone to minor respiratory ailments than the irradiated children suggests, if it suggests anything, that the rays were not entirely inert. The point may be granted that exercise and fresh air are greatly preferable to indoor sessions around a lamp. But is daily exercise in the fresh air always a possibility for schoolchildren in our cities during our long winters? The Council is equally doubtful as to the value of irradiation in the treatment of acute and chronic infections. It will probably be generally admitted that observations on the bactericidal power of the shed blood do not provide sufficient justification for the use of ultra-violet light in inflammatory conditions. But the same might be said of many other accepted methods of treatment, for we do not know with scientific certainty how far the in-vitro immunity

phenomena are accurate expressions of the powers of resistance of the living body.

While thus adducing some of the arguments in favour of a form of treatment which has not only achieved great popularity, but is believed by many clinicians to merit it, we are deeply impressed with the force of the criticisms levelled against its indiscriminate use. It would obviously have been desirable, had it been possible, to organise a trial of light therapy before accounts of its reputed benefits were so blindly accepted by the public. The method, however, has escaped from rigid scientific control, and its ultimate value can now only be assessed by the long and uncertain method of clinical observation. But the story of rickets, with which we started this discussion, gives ample reason for confidence that in the long run neither medical men nor the public can be deceived, and that if they continue to uphold any form of treatment its scientific value will eventually be established.

MEDICAL POLICY IN INDIA.

IT is with mixed feelings that we comment on two addresses, delivered by eminent members of the "independent medical profession" in Calcutta in December last, at a gathering styled the All India Medical Conference. Both Sir NILRATAN SIRCAR and Dr. G. V. DESHMUKH, whose addresses have now reached us, as their medical and other distinctions show, have attained a high status in the profession. Their opinions must command a hearing, and the animus displayed in their orations on this occasion is all the more regrettable on that account. What ground exactly the conference in question set out to cover is not apparent, but Sir NILRATAN, the chairman of the reception committee, and Dr. DESHMUKH, the president of the conference, concerned themselves almost entirely with medical politics in various aspects, and the relations of the independent profession with the Government medical services, and more particularly the Indian Medical Service. It is admitted at once that the work of the medical services, vitally useful as it has been in the development of the country, is open to adverse criticism in certain respects—the sort of criticism which may be levelled at all the European services in India. It is true that in the past the tendency of the official medical men has been to do the responsible work themselves, and to train up their Indian assistants in a subordinate capacity. It is also true that a certain amount of jealousy existed with regard to remunerative appointments and practice, and that vested interests and service claims were sometimes allowed too serious consideration. Then, again, students of the medical colleges and schools had certain real grievances. It has been too much the custom to change professors round from one subject to another, as convenience dictated, without sufficient reference to special qualifications, and teaching has sometimes suffered from this cause. Training in the later years of study and early post-graduate life was likewise adversely affected by the practice of filling house appointments in hospitals by members of the permanent subordinate services, and other handicaps exis ed which it will take time completely to get rid of. But when eminent Indian physicians say that the British in India have been unprofitable stewards—that Government has done practically nothing for education—that their neglect of irrigation has turned a land of peace and plenty into a home of stark want and fell disease—that the people are decimated by diseases of foreign importation—and that alien authority has only a sneer of indifference for genuine merit—it is unnecessary to deny the charges; we ask what place diatribes of this nature have in a medical conference?

The speakers came to more appropriate subjects when discussing the prospective Bill for the constitution of a central medical council for India, though even here racial bias becomes at once apparent in the terms employed. The proposed legislation, one of the most important objects of which is to put the Indian Empire in a better position to negotiate with other countries, and to maintain and enhance the reputation of its medical degrees in the eyes of the rest of the world, was regarded with quite unreasonable suspicion and the views of the conference will be widely reflected. It is suggested that the proposals are the sinister product of an alien bureaucracy (although the department directly responsible for the measure is almost entirely in the hands of distinguished Indians), and that the new central council will be subordinate to the General Medical Council of Great Britain. Hostility to the General Medical Council appears to be a sort of obsession, though people well qualified to know have pointed out over and over again that any intervention by that body in Indian affairs has always been confined to the protection of the interests of the general public at home, while its advice has been of the utmost assistance to India. Do the critics of the Council know what percentage of its work of recent years has dealt with Indian as well as with Colonial affairs? Constantly the President has himself dealt with important Indian matters, while the Council, as a body, has frequently been resorted to for advice on difficult phases of medical policy in India, when applications have always met with a ready and sympathetic response. The suspicious attitude which the spokesmen of the independent profession in India too frequently adopt towards the Council is therefore neither grateful nor well advised, and it is most unfortunate that the same attitude should be adopted with regard to the efforts of the Indian Government to create a body to regulate education, and to meet foreign criticism with regard to the status of the country's medical qualifications abroad. The same distorted and supersensitive nationalism is to be seen in the proposal put forward at the conference with regard to the establishment of chairs in Ayurvedic and Yunani medicine in the medical colleges—this as an extra burden on students who it is contended are already overweighted with a curriculum imposed on them largely through the malevolent machinations of the alien General Medical Council. Persistent ventilation of this matter has always led to the opinion among those who look temperately at the situation that the indigenous systems, however interesting from a historical standpoint, can have no place in a course of study devoted primarily to modern scientific medicine.

It is pleasant to note that Sir NILRATAN SIRCAR ends in a loftier and more reasonable vein by exhorting Indian medical and sanitary experts to devote themselves to investigating various social problems which call for attention; to study the factors which lead to excessive child and maternal mortality, the bearing of defective marriage customs on vitality and fecundity, and the effect of faulty diet and nutrition on various diseases. In these and other similar spheres racial jealousies and ancient differences may surely be disregarded. Meanwhile it is opportune to draw attention to the very liberal reforms which are now in course of introduction in the medical schools and colleges and attached hospitals. A cursory examina-

tion of the staffs will show to what an extent the leading educational posts are already held by Indians. Resident hospital appointments are also being increasingly thrown open to the newly qualified non-official men, and, as one of those whose addresses are here under consideration observes with not unnatural satisfaction, most of the lucrative practice of the larger towns has already found its way into Indian hands. These changes, one would think, should go far to meet the aspirations of independent Indian practitioners, and to reconcile them to the retention of what, after all, in relation to the total population of the country, is only an insignificant number of posts in the military and civil medical services, to serve the needs of the rapidly diminishing Europeans in the army and civil services. But apparently nothing short of the total exclusion of Europeans will satisfy these reformers. If no other reason existed against this course, we may remind them that Western science is a plant of comparatively recent growth in the east, and that it would be strange indeed if it were yet ready to flourish alone without external support.

THE NATURE OF FILTRABLE VIRUSES.

Two recent discussions at the Royal Society had for their subject the ultra-microscopic viruses infecting animals and plants. A large number of diseases in both categories are at the present time commonly attributed to viruses, though the definition of this class of pathogenic agents is not very clear. The character by which a virus is distinguished from other causes of infection are chiefly negative although attempts have been made to find more positive features distinctive of the group. By a virus is usually understood an infective causal agent which cannot be recognised or clearly seen by the microscope; this does not exclude the possibility that the virus particles are just visible in a stained film or by the dark-ground illumination. It has been generally held that all viruses are filter-passers—that is, consisting of particles too small to be stopped by an ordinary bacterial filter. It was this property which first attracted attention to the group, when IVANOVSKI filtered the virus of mosaic disease of tobacco in 1892, and LOEFFLER and FROSCH that of foot-and-mouth disease in 1897. It is now recognised that so-called viruses vary much in the ease with which they penetrate filters. Some like the two just mentioned pass very readily through such filters as a Chamberland III. or a Seitz disc under conditions in which these are quite impermeable to ordinary bacteria. The viruses of distemper and herpes can with proper precautions be obtained in the filtrates but are often retained by the candle. Certain infective agents such as that of typhus fever, which were at one time supposed to be filtrable, are now generally believed not to appear in the filtrate unless the conditions are such as also to allow passage to the smallest bacteria. Filtrability is not a function merely of the size of the essential particles in a virus but also depends on their tendency to adhere to the walls of the filter on account of their surface tension, electric charge, and other properties. In some cases, however, retention by a bacterial filter probably gives a useful indication of the average or minimum size of the active particles in the virus concerned. The rickettsia bodies associated in lice with the virus of typhus are usually at least 0·2 μ in diameter and do not pass through filters for that reason. It may be chiefly on account of the similar or slightly smaller size of the elementary bodies described by PASCHEN and by BORREL, and present in the lesions of vaccinia and fowl-pox, that the viruses of these diseases are not filtrable in the hands of most observers. BEDSON has shown that the virus of herpes, unlike that of foot-and-mouth disease, can be concentrated by centrifugation, and this, taken with the relative filtrability of the viruses, suggests that the particles in herpetic virus belong to a grade in size between that of vaccinia and foot-and-mouth disease. No evidence as to the filtrability of many plant viruses can be obtained because they have only been transmitted by grafting, never by injection.

The third negative property which characterises the group of viruses is the inability of the agent to grow on artificial media. The micro-organism of pleuro-pneumonia in cattle is probably often smaller than the rickettsia of typhus, but like this it is not now reckoned among the viruses as it produces well-defined colonies on solid media. Although the well-accredited viruses cannot be propagated in vitro, they can be shown to multiply in the animal host and often to increase rapidly at some favoured site in the body where the concentration may reach a very high titre, as in vaccinia and foot-and-mouth disease. Obligatory parasitism, then, is one of the most striking and distinctive characters of the viruses and it also presents a very troublesome obstacle to investigation. The absence of all knowledge of truly filtrable forms of life which are not parasitic is a fact which awaits explanation. It might have been expected that, if such minute forms really possessed independent life, similar agents capable of assimilation and multiplication in vitro would have been discovered by their chemical activities. It is only in the region where the size of the borderland viruses—e.g., those of typhus and vaccinia—is approached that facultative saprophytes such as the microbe of pleuro-pneumonia and Olitzky's *B. pneumosintes* are known. In consequence of the inability to secure multiplication of a virus except in living tissues, the idea has been put forward, especially by DOERR, that a virus may not be living but rather catalytic in nature. It is suggested that increase of the virus is due to the living properties of the host, which as the result of stimulation by a small amount of virus reacts by producing fresh virus in large quantities owing to an unwonted or pathological metabolic activity. The notion has recently been examined and commented on by BOYCOTT. This hypothesis has been especially fostered by the study of two virus-like agents, the lytic agent or bacteriophage discovered by TWORT and D'HERELLE, and the filtrable virus of fowl sarcoma. The former, which passes freely through a porcelain filter and resists exposure to a temperature of 60° C., is regarded by D'HERELLE as a parasite which lives and multiplies in susceptible bacteria. There is no doubt much to be said for this view which D'HERELLE supports largely on the ground of the adaptability of the phage to new bacterial hosts. It is, however, opposed by BORDET and by BRONFENBRENNER, and the virus is said occasionally to appear de novo in previously unaffected cultures. The filtrable virus of fowl sarcoma has a very strong claim to be considered an independent living microbe, and is indeed so regarded by GYE and many others. There are difficulties, however, in admitting the very similar mammalian malignant growths into the same category, especially since some of the latter can be produced at will by the use of tar and other chemical substances.

Little difference can be detected between the behaviour in the body of pathogenic bacteria and the

majority of viruses, but our knowledge, especially of the latter, is very imperfect. Important features of disease such as the incubation period, infectivity, and immunity reactions can be paralleled in the two classes, though some minor differences have been claimed in the behaviour of the antisera. The adaptation of the agent to new species of animals and plants by passage is a common feature of diseases which are due to viruses, bacteria, or protozoa. It has been possible to secure the multiplication of the viruses of certain diseases (vaccinia, Rous sarcoma) in cultures of living tissue in vitro, but this cannot be accepted as conclusive evidence of independent life. Research with unseen and uncultivated viruses is a very different thing to dealing with bacteria or protozoa. Every determination of the presence, potency, or increase of a virus must be made by tests for infectivity. The investigation of virus diseases of plants is in some ways still more complicated than when animals are concerned. Many plant viruses can only be transmitted by grafting and the proof that a plant is, or is not, a healthy carrier must be obtained by grafting it on a susceptible stock. The recent advances in ultra-microscopic photography applied to the study of viruses have not yet reached a point where they can give practical assistance. On the whole the evidence and balance of opinion, though by no means unanimous, are in favour of the view that most viruses are living agents, but on account of their peculiar qualities an irrefragable proof seems to be unattainable by existing methods.

Annotations.

"Ne quid nimis."

THE KING.

WE published in THE LANCET of March 9th the official bulletin issued from Craigweil House on March 2nd. Another bulletin was issued from the same residence in the evening of Saturday, March 16th, as follows: "His Majesty the King is steadily, though slowly, regaining health. In strength, vigour, and appearance improvement is definite. The weather is restricting the opportunities for going outside the house. The ray therapy is being continued." The bulletin was signed by Sir Stanley Hewett and Lord Dawson of Penn.

A LABORATORY SERVICE FOR INSURED PERSONS.

THE fact that while money can be found for almost any sort of treatment for insured patients none is available for diagnosis has long been recognised as one of the most serious deficiencies of the National Heath Insurance Acts. The necessity for a laboratory diagnostic service was recognised by the Royal Commission of 1924–26, and the demand for such a service has been growing in strength ever since, but on the plea of lack of funds the Government has taken no steps in the matter. Meanwhile various insurance committees have attempted to make such service available for patients under their charge. Their schemes have differed widely; some have been of such a nature as to throw upon the rates a charge which ought to fall upon insurance funds, others have depended upon arrangements between insurance committees and voluntary hospitals of a type which under the Act of 1928 became ultra vires. There seemed, indeed, to be a risk of the establishment of a series of totally unrelated schemes, without proper supervision, some of them illegal and the result being chaos.

It was partly with a view to meeting this threatened situation that the British Pathologists Association was formed two years ago. As a result of representations from this Association the British Medical Association decided to constitute a consulting pathologists group, which since its inception has been working to produce some practicable scheme for the provision of diagnostic facilities for insured persons. It is regarded as inevitable that the charges should fall for the time being at any rate upon the patients receiving the benefit of the service—that is to say, the patient pays the laboratory fees through his practitioner. Although it is essential for fees to be kept low, the group sees grave dangers in throwing such work open to free competition, with the possibility of fee-cutting and lowered standard of work. It has therefore drawn up a schedule of minimal fees for the ordinary laboratory procedures of general use in clinical medicine. These fees have been calculated on a basis of time and laboratory costs and are designed to provide a reasonable remuneration to a laboratory performing such work at full pressure. A list has been compiled of pathologists in charge of suitable laboratories who are willing to undertake this work at the standard rate of fees. The country has been divided into convenient areas, and insurance committees will, if the scheme is adopted by the representative meeting at Manchester in July, be notified of the pathologists within their area willing to undertake this work. The scheme as it stands will be of undoubted assistance to panel practitioners, but it suffers from the grave drawback of being financially dependent upon the insured patient, who for the most part is not yet educated to spend money on mere diagnosis. Accordingly the volume of work under the scheme at the outset may not be great. Such a service is, however, badly needed, and when funds can be found for its administration as part of medical benefit under the Insurance Acts the existence of a working scheme should save much trouble.

THE PREVALENCE OF APPENDICITIS.

So various are opinions on the incidence of appendicitis among non-European races that Dr. Elsa Uhlenhuth,[1] of the Tübingen School of Tropical Medicine, has made a special study of the literature in the hope of getting at the facts. The general impression is that native races suffer little from appendicitis, but Dr. Uhlenhuth is not sure that this is correct. The greatest mass of information comes from China, where it is the most experienced physician that reports most cases. Many do not come to notice, the Chinaman being slow to consult the foreign doctor, especially for abdominal trouble, for which these "foreign devils" are apt either to prescribe a starvation diet, very unpleasant to a Chinese, or an operation whose outcome is uncertain. The patient, therefore, trusts himself to his domestic remedies, notably opium, which at worst gives him the painless death which he prefers to a life of discomfort. Dr. Uhlenhuth notes that the reports consulted are seldom statistical; rarely does the reporter state what he means by "few" or "many." Much is said about diet being the cause of the disease, but little exact information is given about the diet concerned. There are some who say appendicitis is rare in non-Europeans by reason of the different anatomy of their appendix, but no such difference has been proved. The conclusion reached from this survey is that while appendicitis occurs in all races of men of whom we have information, although few figures are available to show relative frequency, it does seem to be less common in Indians than in English people living in India; also few cases have been reported from Africa. To provide a standard we may say that in the years 1924–26, among an average of 290,000 men in the Army and the Navy, case-rate per 1000 was as follows: (1) In the Army: officers, at home 9,

[1] Arch. für Schiffs- u. Tropen-Hygiene, 1929, xxxiii., 105.

abroad 7½, in all 8¼; other ranks, at home 5, abroad 4¾, in all 4¾. (2) In the Navy (officers and men), at home 4½, abroad 4¼, in all 4½. The figures for the two services together were: at home 5·0, abroad 4·6, in all 4·8, but, of course, many slight cases are included.

THE METABOLISM OF CHOLESTEROL

CHOLESTEROL plays a very important part in the body, being an integral constituent of all living cells, and particularly associated with the brain and nervous system. The importance of the group of sterols to which it belongs has been further emphasised by the recent discovery that irradiation of sterols leads to the formation of vitamin D. O. Rosenheim and T. A. Webster, it is true, showed[1] that cholesterol itself is not the precursor, but the closely related substance ergosterol which is contained as an impurity in cholesterol from animal sources and only with difficulty removed from it. In other respects, too, our knowledge of cholesterol metabolism is very incomplete. The substance is supposed to originate mainly in the vegetable kingdom, although a number of workers have shown that it can be synthesised by the animal organism. The cortex of the suprarenal gland plays an important part in this synthesis, but the nature of the parent substance remains obscure. Prolonged feeding on diets containing very large amounts of cholesterol causes a definite increase in the amount of this substance circulating in the blood plasma; J. A. Gardner and H. Gainsborough have, however, shown[2] that there is no increase as the result of a single meal. The change in the cholesterol content of the plasma during the process of digestion is taken to indicate the simultaneous occurrence of an active endogenous metabolism in which cholesterol takes part.

Accurate information concerning the quantitative distribution of cholesterol in the body is of comparatively recent origin, since suitable methods of analysis have only developed during the past 15 or 20 years. Most of the studies have centred round the determination of the substance in the blood, and its variation in health and disease, with a view to the possible use of chemical examination as a means of diagnosis. The results of such researches have not as yet made it possible to assign any very definite diagnostic value to these determinations except in certain cases. It is, however, generally recognised that in the later months of pregnancy, in certain forms of nephritis and nephrosis, in biliary obstruction and variably in diabetes mellitus, an increase occurs in the blood-cholesterol. On the other hand, the amount may be lowered in pernicious anæmia and in infective conditions, and these changes are so well marked that their occurrence is often unmistakable. Attempts to extend these observations to other conditions have in general been less successful, for the reason that the changes concerned, if any, are of smaller range and because our knowledge of the variation of the normal cholesterol content is incomplete.

Gardner has laid special emphasis upon the proportion of cholesterol present as the free substance and that present as ester. It has long been known that the cholesterol in the blood exists largely combined as esters, particularly in the plasma where the average ratio of ester to free substance may be of the order two to one. The ratio is variable, and various authorities do not agree as to the exact figures, doubtless due to the use of different analytical methods. On the other hand, the red blood corpuscles probably contain cholesterol mainly in the free state. Accurate determination of the combined cholesterol requires previous precipitation of the free substance with digitonin, a somewhat laborious method necessitating the use of 20 c.cm. of blood. Probably for this reason most workers have determined the total cholesterol, using a simple colorimetric method requiring only 1 c.cm. of blood. However, as Gardner points out, the implied assumption that free and combined cholesterol have the same significance is by no means proven. E. Goodall has recently exposed in our own columns[3] the slender basis for the assertion that there is a regular menstrual fall in the blood-cholesterol. In our present issue Gardner and Gainsborough describe the disturbance of cholesterol metabolism which occurs during pregnancy; in agreement with earlier observers they find a rise in the free cholesterol of the plasma up to a maximum at about the thirtieth week of pregnancy with a concurrent fall in the combined sterol. The occurrence of increased amounts of free cholesterol in the later stages of pregnancy has led to the assumption that the pituitary gland, which F. H. A. Marshall has shown to be increased in activity at this time, is the stimulus to the mobilisation of fat from the adipose tissues. R. Coope found that injection of pituitrin into rabbits caused a considerable increase of fat in the liver. Possibly the increased concentration of fat and cholesterol in the blood during pregnancy is necessary in order to supply the fœtus with these materials. Such questions as these are unanswerable until our knowledge of normal cholesterol metabolism is more complete than it is at present.

[1] THE LANCET, 1927, i, 306.
[2] Biochem. Jour., 1928, xxii., 1048.

TULARÆMIA IN DOMESTIC ANIMALS.

SINCE McCoy and Chapin in 1911 first succeeded in isolating the organism of tularæmia (*Bacterium tularense*) from the lesions of infected ground-squirrels in California, it has been ascertained that the virus may be harboured by many different hosts under natural and experimental conditions. The first demonstration of human infection was made in 1914 by Wherry and Lamb in cases of ulcerative conjunctivitis accompanied by fever and glandular enlargement, but the disease as a clinical entity dates from observations in the State of Utah since 1908, or earlier on cases of what was known locally as "deerfly fever." It was not, however, until 1919 that Francis established the fact that these cases were due to tularæmia infection conveyed to man from jack-rabbits by the biting fly, *Chrysops discalis*. In 1923 the organism was isolated from infected rabbits exposed for sale in the Washington market, and was shown to be the cause of a condition, known to the trade as "rabbit fever," among rabbit skinners and dressers. Since then human cases have cropped up in many States of the Union and the disease has also been reported from Japan. In 1926 three fatal cases, almost certainly due to rabbit infection, were reported from Virginia. Besides other transmitting agents, infection may be conveyed by means of the wood tick, *Dermacentor andersoni*, which apparently can determine the continuance of an epizoötic among rodents and may possibly carry infection to man. Other animals susceptible to natural infection are the coyote and the wood mouse, but hitherto the condition has been rarely noticed in domestic animals, of which the calf, pig, and goat appear to be quite resistant, and it is only recently,[4] in the State of Montana, that the virus has been detected in the blood of dead and dying sheep, and in dermacentor ticks removed from the bodies. So long ago as 1923 heavy losses among sheep, coincident with high mortality among jack-rabbits, were observed in these districts, and now that their cause is recognised, the question naturally arises how far such conditions among sheep and rabbits are of importance to the general public, not only in the countries immediately concerned but elsewhere, and what danger, if any, there is of importation. Further work is necessary to determine whether the meat of slaughtered sheep is a possible source of human infection. It seems that the principal peril lies with those concerned

[3] THE LANCET, Feb. 23rd, p. 384.
[4] Parker and Dade: Public Health Reports of the United States Public Health Service, 1929, xliv., 126.

with the dressing of the animals for sale, infection being definitely possible through contamination of the hands and eyes with infected tissues or through the excrement and tissues of ticks. With sheep the chance that infection may reach the market and be a source of danger to persons in slaughter- and packing-houses and to the consuming public generally is more remote but cannot be excluded, especially if animals are slaughtered for immediate local consumption. The importation of the virus into this country is even less probable, but is by no means impossible.

A MEANING FOR SYNERGISM.

"SYNERGISM" is a term that has been freely and loosely used in connexion with anæsthetics. It is doubtful whether those who introduced the word in describing experience with anæsthetic drugs had a clear conception of what they meant by it, and it is obvious that most of those who have since talked of synergistic action have no such conception. We are glad to see that criticisms levelled against the very existence of what is presumably meant by synergism have produced a reply from J. T. Gwathmey[1] in which there is, at any rate, a definite idea of "synergism" as represented by the combined action of magnesium sulphate and morphine. Gwathmey claims, on apparently good clinical grounds, that the pain-controlling action of morphine is greatly prolonged when it is used in conjunction with magnesium sulphate. He does not claim an increased power for the action of the morphine but merely a prolongation of its effects. Here, at least, is something definite to go on, if in the future the term "synergistic action" is confined to the ability of one drug to prolong the effects of another. In the past their meaning in this connexion has been vague, different, and inaccurate. The word "synergism" might apparently just as well have been used to describe the ordinary sequence of "gas and ether," after morphine and atropine, as any other combination of sedative and anæsthetic drugs.

From the more general pharmacological aspect the inherent difficulties of the question of "synergism" have been aggravated by loose thinking and by a loose use of the term. It would be preferable if it were employed in its purely literal significance—viz., that two or more drugs when administered in combination *work together* in the sense that they do not antagonise each other. The result would then be the simple arithmetical summation of the effects of each individual drug. There are numerous examples of synergism of this nature in practical therapeutics. It is utilised, for instance, in the case of purgatives and diuretics to secure the summation of the desirable effects of several drugs, while the side actions are not increased or may even be neutralised. But synergism is often employed in the sense that the combined action of two or more drugs is greater than could be calculated from their individual effects. *Potentiation* in this case is the term much to be preferred. The best studied examples of this type of action are in the narcotic group, where there is a certain amount of evidence to suggest that when alcohol, chloroform, or ether are administered together the result is a simple summation of their effects, while the addition of certain alkaloids such as morphine and hyoscine gives considerable potentiation. But it must be recognised that in the commonest and most apparent example of potentiation—viz., "twilight sleep"—it is seriously doubted by competent authorities whether there is any real potentiation of morphine by hyoscine. Experimental evidence in support of potentiation is difficult to obtain, and it is still more difficult to explain its mechanism. But it is certain that the changes in the human body produced by disease often modify the effects of drugs to a remarkable extent, and there is nothing inherently improbable in the idea that one drug may so alter the condition of the body as to render it more susceptible to the action of another drug, though it may be impossible at present to explain how this happens.

[1] Jour. Amer. Med. Assoc., Dec. 8th, 1928.

VOCATIONAL GUIDANCE.

DURING the last ten years a considerable amount of research has been directed towards the parallel problems of vocational guidance and vocational selection—the discovery of the most suitable employment for the individual worker, and the selection of the most suitable workers for any given employment. The "square peg in the round hole" has become a synonym for inefficiency, and it is the object of this type of research to remove this anomaly, unfortunately so common because of the random manner in which many, perhaps the majority of, children leaving school drift into employment. Two bodies have been engaged in these investigations: the Industrial Fatigue Research Board, which is itself a branch of the Medical Research Council, and which began a number of inquiries into industrial conditions during the war; and the National Institute of Industrial Psychology, which was established in 1921, and has concerned itself chiefly with vocational problems. Both bodies have issued reports from time to time, and the latest brochure[1] records the results of an investigation, carried out by the former body for the latter, dealing with the "Use of Performance Tests of Intelligence in Vocational Guidance." Besides these official researches, much valuable work is being done by several large firms, who have appointed psychologists to work out the best methods of selection for the purposes of their own special work. Some local education authorities are also endeavouring to discover better means of advising children leaving school regarding choice of an occupation.

The problems are not easy of solution. For any efficient scheme of vocational guidance there must first of all be some grasp of the qualities of mind or skill required in different occupations; and, secondly, there must be some reliable scheme for testing these qualities in candidates. The difficulty arises from the complexity of human psychology, about which there is still far from universal agreement. On the whole there is now fairly general acceptance of the thesis that, running through all mental activities and conditioning them, there is a factor of general intelligence, known to the scientific psychologist as "g"—a factor varying in individuals according to the normal curve of variation. Besides this, however, there is a multitude of specific factors, specific to individual capacities and skills, memories and reasoning capacities, mathematical capacities, manual ability, mechanical constructiveness—to give only a few examples. There is still much difference of opinion whether in relation to mechanical trades there is a general mechanical ability contributing to them all, a general power to appreciate and deal practically with spatial relations; or whether there are only specialised capacities, functioning in one or a few definite directions. This point is discussed in the report now issued. The performance tests employed are well known to mental testers—the Porteus mazes, the cube imitation and cube construction tests, Dearborn's formboard, Healy's picture completion tests, Woodworth and Wells's substitution test, and a few others. All were found to correlate to considerable degree with "g," although not so closely as the more verbal types of tests of the Binet pattern. Specific factors played a larger part than in the Binet tests, but while certain correlations suggested that there was another general factor of "spatial relations" affecting success in several of these tests, it was not felt that the evidence was conclusive for any general non-verbal or practical ability factor. To use these tests, then, as a group from which to draw conclusions is impossible; each test must be taken separately,

[1] Medical Research Council: Industrial Fatigue Research Board. Report No. 53. H.M. Stationery Office. 2*s.* 6*d.*

its specific meaning sought for in order to estimate its vocational significance. A preliminary application of a few of the tests to groups of carpenters, fitters, electricians, and smiths appears to support the idea that they may be of value vocationally.

The results of this investigation are therefore somewhat limited, but the complexity of the problems for solution makes progress inevitably slow. The more empirical factory method of trying out tests to gauge capacity in a specific occupation may produce more rapid practical results, but for a thoroughly sound scientific basis and coördination of the work, investigations such as the present are essential. In addition they will make a valuable contribution to our understanding of human psychology, especially in its non-linguistic aspects, formerly somewhat neglected. It should scarcely be necessary to insist upon the importance of the factor of interest in psychology and in work. It is possible that the factors, interest and capacities, run more or less parallel, but the parallelism is not absolute. and vocational guidance schemes will have to guard themselves against the possible danger of placing a man in work in which he is not interested, assuming, that is, that the conditions of modern industry with its infinite subdivisions, allow any place for human interest.

THE RATIONALE OF THERAPEUTIC PNEUMOTHORAX.

WHEN Forlanini introduced artificial pneumothorax as a method of treating pulmonary tuberculosis, he said that a cure could only be obtained by keeping the lung in a state of complete immobility for two years or more. Murphy and his co-workers, on the other hand, regarded functional and not absolute rest as the essential, and it is now well known that many tuberculous pulmonary lesions can heal satisfactorily even when incomplete collapse, with respiratory movement of the affected lung, is maintained for a period. Stuart Tidey,[1] indeed, denies the possibility of complete immobilisation of the lung by induced pneumothorax, and considers that although rest is an important factor in the arrest of active disease of the pulmonary tissues, it is not the only one, and not the most potent. Remarking that no ulcer, whether on the inside or on the surface of the body, can heal if the edges are subjected to continued tension, he gives it as his opinion that healing of ulcerative pulmonary lesions can only be looked for if relaxation of the peripheral pull on the diseased area has been secured. This relaxation of peripheral tension may be brought about in various ways—e.g., by compression of the chest wall by strapping, or by special splints, by artificial pneumothorax, or by thoracoplasty. Nature herself tries to diminish the peripheral pull by making the chest wall contract over a fibroid lesion in the lung. In an original contribution [2] entitled Pneumothorax Expérimental, C. B. Udaondo and A. Vadone, of Buenos Aires, have produced some evidence which supports this contention that a collapsed lung is not at rest, and that the principal effect of pneumothorax is to diminish the distension of the pulmonary parenchyma. In an attempt to reproduce the conditions obtaining in a pneumothorax cavity, they placed the lungs of a freshly killed rabbit in a half-litre bottle, and tied the trachea to a tube passing through a rubber cork which hermetically sealed the bottle. Another tube connected the cavity of the bottle with a 10 c.cm. syringe, whilst a pneumothorax needle of proportionately reduced calibre was also passed through the cork into the bottle and connected it with a Küss pneumothorax apparatus and manometer. The investigators were thus able to set up either negative or positive pressures in the bottle, and so either distending or collapsing the lungs; at the same time they could imitate the rhythmic movements of respiration by moving the piston of the syringe. They found that even the smallest oscillations of the manometer corresponded to the movements set up by the distension and retraction of the pulmonary alveoli. It is wrong to suppose that, if a pneumothorax is present, the lung must necessarily be completely immobilised; Udaondo and Vadone show that when the lung is entirely collapsed it offers less resistance to an inspiratory dilatation than when it is distended—that is to say, that the manometric oscillations are deeper and respond more quickly to the least pulmonary movement when the lung is collapsed. They regard the term "average pleural pressure" as a theoretical figure obtained sometimes by calculation and occasionally by artifices of manometric technique. The lung is never subjected to a fixed pressure, as it responds to the least fluctuation of pressure taking place in the pleural cavity. But, being given these fluctuations, the figure which most accurately shows the degree of collapse is that which corresponds to the end of expiration.

[1] Compression of the Lung in the Treatment of Pulmonary Lesions. London, 1927.

[2] Arch. méd-chir. de l'appar. resp., 1928, iii., 363.

OPHTHALMOLOGY IN RELATION TO RESEARCH.

IN an address which he gave to the recent Indian Science Congress at Madras Lieut.-Colonel R. E. Wright pointed out various directions in which ophthalmic research has of late advanced our knowledge of general as well as of ocular pathology. As an instance of the former he cites ophthalmoscopic observation of the retinal vessels, by means of which, he says, we are enabled to gauge, more accurately perhaps than by any other method that can be applied during life, the probable changes which take place in the cerebral vessels. The fact that these observations may now be recorded accurately and scientifically by means of photography enhances their value. The chief advances in ocular pathology in the narrower sense Colonel Wright finds in the invention of the slit-lamp, by means of which the nature of the anterior structures of the eyeball can be studied more in detail than before, investigations into the causation of cataract in connexion, on the one hand, with the chemical nature of lens protein, and on the other, with alterations in the fluid available to the lens for its nutrition. It is admitted that these investigations have not as yet advanced to the point of providing results clinically available. In connexion with trachoma the late H. Noguchi's bacteriological researches as to its cause are mentioned, though as yet his results lack confirmation by others. Other important works referred to as illuminating special branches of ophthalmology are Prof. Arthur Thomson's work on the anatomy of the human eye, Prof. A. Onodi's work on the nasal accessory sinuses, Miss Ida Mann's book on ocular embryology, published last year, which throws considerable light on the genesis of certain congenital defects, and the researches of W. S. Duke-Elder on the circulatory conditions of the fluids of the eyeball, which increase our knowledge of the pathology of glaucoma and foreshadow the possibility of advances in the future in the medical as opposed to the surgical treatment of that affection. Colonel Wright concludes with a reference to Sir John Parsons's recent work, "An Introduction to the Theory of Perception," in which the abstruse problems connected with the philosophy of vision are lucidly discussed.

THE SUPPLY OF DENTISTS.

THE Dentists Register for 1929 which has just been issued[1] contains 14,388 names, a diminution of 188 on the previous year. The number of names added by registration during the year 1928 was 261 in the British list, 1 in the Colonial, and 2 in the Foreign. Twenty-two applicants were registered under the

[1] London: Published for the Dental Board of the United Kingdom, 44, Hallam-street, W., by Constable and Co., Ltd. 12*s.*; copies for previous years, 1*s.*

Dentists Act of 1921, the others on account of registrable qualifications. Of the 703 names which appear last year and not this, 201 were removed from the Register on evidence of death, 3 by disciplinary action, and 499 for other reasons, including failure to supply notice of change of address or to pay the fee of £4 demanded annually for retention on the Register. During the year 251 names were restored to the Register after compliance with the regulations. Of the total number of registered dentists not quite one-half, or 6824, are registered with medical, surgical, or dental qualifications, while the remaining 7564 are registered under the provisions of the Dentists Acts of 1878 and 1921. The total of dental students registered in 1928 was 256, the number of entries having increased slowly but steadily since 1925, but the number is obviously not yet sufficient to neutralise the wastage. The Dentists Register differs from the Medical Register in providing a local list of names so that it may be seen at a glance what dental practitioners are available in any English town or Scottish burgh.

THE LOCAL GOVERNMENT BILL.

A BRIEF account is given in our Parliamentary Intelligence columns of the important proceedings with which the Report stage of this Bill in the House of Lords closed on Thursday, March 14th, when the question which has aroused the principal discussion—namely, the inclusion of the word "treatment" in the functions of the advisory committees was temporarily settled adversely. In a final amendment to the related clause Lord Dawson moved to add to the bodies which local authorities ought to consult "the medical faculty of any university which serves the area, and the duly qualified medical practitioners in the area," and argued that it would be an obvious advantage that the representatives of the faculties of medicine who were concerned with the higher laboratory investigations and various forms of research should be able to join many representations by way of conference with the council. As regarded the question of the duly qualified medical practitioners in the area, it must be borne in mind, he said, that the doctors who up to now had given their advice—and very excellent advice for they were admirable in their own domain of preventive medicine—amounted to about 1700 in England and Wales, while the doctors who were concerned with curative medicine numbered something like 28,000. From this he argued that "when they were going to add to the duties of these councils by assigning curative functions to the hospital work, there should be some representatives of those people who spent their lives in dealing with disease and that it should not be left too exclusively as heretofore in the hands of the very excellent men whose knowledge and experience was limited to preventive medicine." Lord Onslow, however, considered that these points were met by including in the committees those medical men who were conversant with hospitals and deprecated the addition of medical men, however eminent, whose connexion might merely be that of interest in medical education. He thought also that only confusion would be caused by the addition to the advisory bodies of medical men not connected with the hospitals. It will be seen, therefore, that Lord Dawson's efforts to bring into proper relation with the new hospital administration the experience and life-work of the general practitioner have ended in failure for the time being, but his vigorous representations may yet play an effective part at the final stages.

A VALUABLE YEAR BOOK.

WE have received from Messrs. Charles Griffin and Co., Ltd., a copy of the Official Year Book of the Scientific and Learned Societies of Great Britain and Ireland for 1928, which contains a record of work done in science, literature, and art during the session 1927–28 by numerous societies and Government institutions. This is the forty-fifth annual volume of a useful compilation, and deserves a larger measure of support than appears to be forthcoming from the societies whose work is recorded. Next year it is proposed somewhat to limit the scope of the issue by inserting lists not of papers read but only those which are published by the societies in question, and so become permanently available for reference. We hope that the publishers will receive the support necessary to enable them to continue what is one of our most valuable and most accurate works of reference. The price of the volume, which is well printed and indexed, is 18*s*.

THE KING has appointed Dr. William Macrae Taylor to be Surgeon Apothecary to His Majesty's Household at the Palace of Holyroodhouse, in succession to the late Colonel D. J. Graham.

Dr. Charles Herbert Hampshire, F.I.C., has been appointed by the General Medical Council to be Secretary of the Pharmacopœia Commission, and will take up his duties from June 1st. Communications intended for the Commission should be addressed to the Secretary of that body at 44, Hallam-street, London, W.1.

ACCORDING to the Students' Register, issued by the General Medical Council, the number of medical students registered during 1928 was 1363—namely, 545 in England, 577 in Scotland, 241 in Ireland. The total number is a substantial increase over last year's total of 1214, larger than any entry since 1922, and approaching the pre-war average of the five years 1909–13—viz., 1420.

WE regret to announce the death of Dr. Lionel Sells on Saturday last at the age of 52. One of the group of men who early took up the study of X rays in this country, he served in the South African War as radiologist attached to the Royal Army Medical Corps, and later joined the medical service of Uganda where he investigated sleeping sickness. As a result of his radiological work he lost several fingers of each hand.

Sir StClair Thomson has been elected Correspondant Étranger de l'Académie de Médecine, Paris.

A CONGRESS AT ZÜRICH.—As we have already announced, the Royal Institute of Public Health will hold a congress at Zürich in Switzerland next Whitsuntide, from May 15th to 20th. The preliminary programme has now been issued, and shows that the Congress will meet in seven sections—namely (1) state medicine and municipal and social hygiene; (2) industrial hygiene and industrial diseases; (3) child welfare, school hygiene, and women and public health; (4) pathology, bacteriology, and biochemistry; (5) tuberculosis; (6) climatology and sports hygiene, and (7) veterinary medicine and meat hygiene. The social events include a reception by the authorities of the Canton and City of Zürich on May 15th, and a banquet on the 16th, and there will be an opportunity of visiting large numbers of institutions and centres of interest in the neighbourhood. A tour on the lake, and tours to Rheinfelden, the Rhine Falls, and Schaffhausen are among excursions for those attending the Congress, whilst extensions are also being arranged, by the Swiss Government and railways, enabling participants to pay visits at reduced rates to Lucerne, Montreux, Leysin, and Montana, to Davos, Arosa, Innsbruck, Oberammergan, and Munich, or to Czecho-Slovakia. The address of the Institute in London is 37, Russell-square, W.C. 1; the arrangements for travel and accommodation are in the hands of Sir Henry Lunn, Ltd., 5, Endsleigh-gardens, W.C. 1. It is hoped that any who are interested will apply for membership of the Congress.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXVI.—ALBUMINURIA.

TESTING the urine for albumin is an essential part of clinical examination, and will always remain so. It is true that an albuminuria may prove to be of little significance, but on the other hand it may be the determining factor in the diagnosis and prognosis of some important diseases, and its discovery imposes on the practitioner of medicine the duty of seeking further evidence to decide this very point.

The albumin commonly found in urine is a coagulable protein identical with the serum albumin of the blood, but other proteins may also be present —globulin, nucleo-protein, and on rare occasions a peculiar proteose known as the "Bence-Jones protein." For this reason the term proteinuria tends to replace the older term in some quarters, but this is neither necessary nor justified, for common usage has given a meaning to the term albuminuria which cannot be mistaken—viz., the presence in urine of a protein in sufficient amount to be easily demonstrated by the heat coagulation test or by one of the precipitation tests.

Tests.

We do not want merely to know which is theoretically the best test, but rather to practise the simplest and cheapest tests which are adequate for the purpose and to understand their variations and fallacies. Protein can be demonstrated by coagulation reactions, precipitation reactions, and colour reactions, and there are literally hundreds of methods and reagents available for the purpose. Colour reactions cannot be applied directly to urine, so those in most common use are the heat and acetic acid test, Heller's cold nitric acid test, and precipitation by salicyl-sulphonic acid, trichloracetic acid, phosphotungstic acid, hydroferro-cyanic acid, or picric acid; and for globulin and nucleo-protein dilute acetic acid in the cold.

For ordinary practice the most satisfactory reagent is probably (1) *salicyl-sulphonic acid*. The substance is a non-corrosive white powder exceedingly soluble in water, keeps well in solution, and is easily carried about. In testing for protein a few drops of a saturated aqueous solution of the acid are added to urine in a test-tube, and if protein is present a white precipitate is formed, varying from a faint opalescence to a dense white curd according to the amount. It should be noted that urines do not give the test unless the reaction of the mixture of reagent and urine is acid, but obviously it is only in very few cases of exceptionally alkaline urines, such as results after taking large doses of alkali, that protein could possibly be missed. In such cases the difficulty is overcome by adding a few drops of acetic acid to the urine before adding the reagent.

For routine hospital work, and where it is desired to learn something of the nature of the proteins present, the urine should be always tested also by (2) the *heat and acetic acid test*, and by (3) the addition of 4–6 drops of 20 per cent. acetic acid without heating. The heat coagulation test is necessary for the detection of the Bence-Jones protein, which appears almost as soon as the test-tube is warmed (50–55° C.), and almost disappears on boiling. The dilute acetic acid in the cold test is necessary for the detection of globulin, which rarely may be present without much albumin, especially in my experience in asthma and allergic diseases, and appears slowly as a white cloud about five or six seconds after the addition of the acid. The quantitative estimation is rarely necessary, but if required, the well-known Esbach's method is sufficient.

It is usual to record the amount of albumin from the qualitative test in some such manner as this. (*a*) Faintest possible trace—an amount shown by a faint opalescence recognisable only when compared to a test-tube of untreated urine seen against a dark background. (*b*) Trace—an opalescence seen easily against a dark background. (*c*) Fair amount—a distinct curdy precipitate. (*d*) Large amount—a dense precipitate. A trace of albumin corresponds to less than ½-part per 1000, and a large amount to more than 5 parts per 1000 on the Esbach scale.

To summarise, testing for albumin is best done by putting the urine into four test-tubes. The first of these is left untreated, and used for comparison. The second is treated with 5 or 6 drops of salicyl-sulphonic acid solution, the third by heating and adding a few drops of acetic acid, the fourth by the addition of 5 or 6 drops of 20 per cent. acetic without heating. Comparison of these tubes will show the relative amounts of total protein, heat coagulable albumin, and globulin.

The Meaning of the Result.

It is now well recognised that in itself albuminuria is not necessarily a sign, or even a warning, of disease of the kidney. It may arise from the presence of pus, spermatozoa, or urethral secretion in the urine, but apart from these a group of causes may give rise to intermittent or temporary albuminuria which cannot be regarded as a sign of any disease. These "functional" or "physiological albuminurias" include a variety known as "orthostatic" or "adolescent albuminuria." A complete and satisfactory explanation has never been given for these forms, but they may result from exposure to excessive cold, from excessive exercise, from taking certain drugs, or from some unimportant constitutional factor in rapidly growing adolescents. H. H. Bashford has had an opportunity of examining a group of these cases after 20 to 30 years, and reports that they showed no greater liability to disease or sickness than the control groups who had no albuminuria in adolescence. He reports also that in about one-fifth of the cases the condition may persist into the third decade of life, and that the children of these subjects are likely to show the same symptom.

To assess the significance of albuminuria it is thus necessary to know: (*a*) the age and history of the patient; (*b*) something of the nature and amount of the protein in the urine; (*c*) whether the albuminuria is constant or intermittent; (*d*) if there are any other signs of kidney diseases, which in their order of importance are œdema, red cells in the urine, pyuria, impaired renal function tests and casts; (*e*) if general examination reveals any cause of the albuminuria, the chief of which are general arterio-sclerosis, acute infections, acute allergic disorders, heart diseases, liver diseases, chronic toxæmias from syphilis, tuberculosis, sepsis, and pregnancy.

Keeping these various points in mind it is possible to conduct an examination which would yield sufficient evidence to decide whether the albuminuria is (1) an innocent functional albuminuria, (2) due to kidney diseases, or (3) due to a general disease or toxæmia. In general terms it may be stated that when the protein is albumin or globulin, is intermittent and not constant, is not accompanied by the presence of blood cells, pus, casts, or œdema, and is not to be accounted for by obvious evidence of general disease or toxæmia, and the patient is under the age of 35, it is reasonable to presume that the albuminuria is a functional one of no importance.

Age and History of the Patient.—An albuminuria in apparently healthy new-born infants is common and of no importance, since it disappears after six or seven days. In later infancy and early childhood it is again common, but is then pathological and usually denotes either kidney disease or latent sepsis, especially congenital syphilis, tuberculosis, middle-ear disease, and skin sepsis. From later childhood to the age of 35 the various forms of functional albuminuria are common. After that age albuminuria is

probably always due to some pathological cause, but in practice, if it is the only sign of disease, it requires no drastic treatment.

The history of the patient may be helpful, but a short transient attack of acute nephritis or of scarlet fever five or ten years earlier must not be regarded too seriously, for an inflammatory lesion of the kidney lasting only a few days will have caused no permanent damage to the kidneys. I have followed cases who have had repeated attacks of hæmorrhagic nephritis for more than ten years without any apparent damage to the kidney, the urine remaining free from albumin and other signs in the intervals.

Nature and Amount of the Protein.—The rare occurrence of Bence-Jones protein or of globulin *without* any albumin can first be disposed of. If a Bence-Jones protein is present, the patient is likely to be suffering from a new growth of the bones with diffuse secondary deposits, probably of the nature of myeloma.

If globulin only is revealed by the acetic acid in the cold test and there is practically no albumin coagulable by heat, some transient condition, such as asthma or some form of functional albuminuria, is suggested. Further than this we cannot go, for when both albumin and globulin are definitely present there is no significance in the relative amounts of these two substances.

The amount of the albumin is of little help. Certainly, when only the faintest possible trace is found, it can be disregarded, and even as much as 5 to 10 parts per 1000 may be present in an entirely innocent case of functional albuminuria.

Constant or Intermittent Albuminuria.—It is o great importance to find out whether or not the albuminuria is constant in all specimens. A series of two-hourly specimens should be examined ; when albumin is entirely absent during rest, and returns when the patient resumes the erect posture, it can be presumed to be functional. Confirmation of this can be sought by observation of the effect of a large dose of alkali or of calcium on the albuminuria. When the albuminuria disappears as a result of those measures, the patient is unlikely to be suffering from organic kidney disease.

Other Signs of Kidney Disease.—In all cases a careful and consistent search for red blood cells should be made, since these are the chief sign of inflammatory lesions in the kidney. In cases of parenchymatous tubular nephritis (nephrosis) there will be no hæmaturia, but œdema or a history of œdema will be found. On the other hand, an occasional hyaline or epithelial cast is not to be regarded too seriously, for they may be present without any kidney disease.

Renal function tests are not likely to be of great value in the doubtful cases, for it is in these very cases that the albuminuria will precede that degree of impairment of the renal function necessary to affect the efficiency of the kidney. But it is always wise to estimate the urea concentrating power of the kidneys and the blood-urea. If the urea concentration is below 1·8 per cent. and the blood-urea above 40 mg. per 100 c.cm. definite renal damage can be presumed.

General Examination.

Chief attention should be directed to the condition of the arteries, heart, and blood pressure. In patients with primary arterio-sclerosis and hypertension the presence or absence of albuminuria is one of the best guides to prognosis. So long as they remain free from albumin it is relatively good, but with the appearance of constant albuminuria the outlook is grave.

Albuminuria may result from so many febrile infections and general diseases that its significance under these circumstances is not likely to be mistaken. Its association with pregnancy is also well understood, and it is now widely realised that if it appears during pregnancy special antenatal care must be exercised and repeated examinations must be made in case it is a sign either of pre-eclamptic toxæmia or of nephritic toxæmia.

When so much has been claimed for latent focal infections as a cause of many obscure diseases, it is natural that these should have been suspected in cases of albuminuria where there is no other obvious explanation. It is certainly true that chronic bone infections, syphilis, and caseous tuberculous glands may so affect the kidney as to produce what might be called a toxæmic albuminuria. Probably there is some tubular degeneration of the kidneys in these cases, and if it is an albuminuria which is more or less constant in all specimens, it is rational to deal with any obvious focal infection. But always it must be remembered that if the patient is under 35, has no red cells in the urine, and appears to be otherwise in good health, the probability is that the albuminuria is an innocent functional affair. Every person passes albumin at some time or other, and at any given time it can be found in from 5 to 10 per cent. of whatever group of healthy individuals the observer may examine.

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Special Articles.

CLEMENS PIRQUET AND HIS WORK

AS DIRECTOR OF THE VIENNA UNIVERSITY KINDER-KLINIK, 1911–1929.

BY the untimely death of Prof. Clemens Freiherr von Pirquet in Vienna on Feb. 28th the medical faculty of that University loses at once a distinguished professor and a rare personality. His death will also be mourned by a large circle of English and American friends and colleagues, for, even at that most cosmopolitan of Universities, Pirquet was remarkable for a catholicity of interests and sympathies which knew no barriers of race, religion, or nationality.

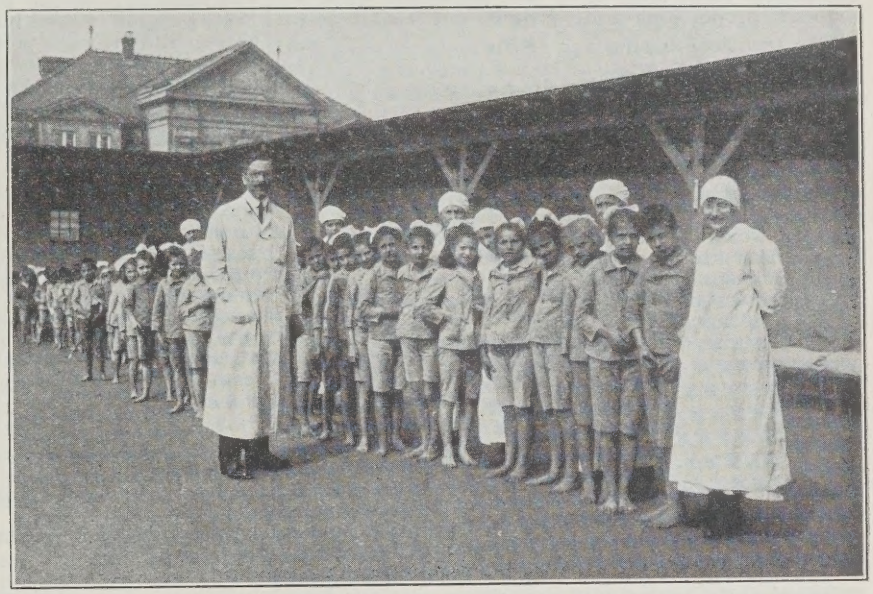
Clemens v. Pirquet, one of the younger sons of a Roman Catholic family belonging to the Austrian landed aristocracy, was born in 1874 at the village of Hirschstetten near Vienna, and was originally destined for the Church and educated for that purpose. This plan was, however, abandoned, and after studying at the Universities of Innsbruck, Vienna, and Graz he graduated in medicine at the latter University and shortly afterwards became assistant to Prof. Theodor Escherich, then Director of the Vienna Kinderklinik.

Pirquet's many important contributions to medicine, both as scientist, physician, and organiser, are especially notable for the originality and independence of thought they display. His early scientific work was devoted to bacteriology and immunity, more especially to the phenomenon to which he gave the name of Allergy, the condition in which an animal becomes supersensitive to foreign proteins, especially those derived from infecting microbes. To this period belong his important researches on serum sickness (Serumkrankheit) and on the immunological reactions following infection with tuberculosis, including the studies which led to the publication in 1907 of the skin test for the diagnosis of tuberculosis which bears his name. The analogous work with diphtheria carried out by his colleague and famous pupil Schick owes much to Pirquet's teaching and example. The reputation thus achieved was probably the cause of the invitation to the Chair of Pediatrics in Baltimore, which Pirquet accepted in 1908 and held for about 18 months. Then followed two years as Professor of Children's Diseases in Breslau, after which, in 1911, he was called to Vienna as Director of the University

Kinderklinik and successor to his old chief Theodor Escherich.

The magnificent Kinderklinik of the Vienna University was just completed when Pirquet took up his new duties there. In its present form it may be regarded as an expression of the genius of its first Director, not only in its material perfection but in the manifold nature of its activities and the spirit with which it is animated. It would be hard to find an institution where a real devotion to scientific research is combined so perfectly with an assidious care for the welfare and happiness of the sick children and with an affectionate consideration for the medical and nursing staff of every grade. It has been said that Pirquet transformed the ward maids into nursing sisters and these further into scientific colleagues. The vast series of investigations upon human nutrition which have occupied the attention of the Director and his assistants during recent years would have been impossible without the intelligent coöperation of his nursing staff. The results of his theoretical researches upon the nutritive requirements of the child at different ages and under differing conditions of sickness and health were applied conscientiously to the nutrition of every small patient. The hospital kitchen became the laboratory for this important work, and was one of the most impressive departments of the Klinik, never omitted when Prof. Pirquet conducted guests on a tour round the hospital. When asked how he succeeded in making his kitchen the instrument of scientific precision by which his "Nem" System could be applied, he would reply that the first step had been to place it in the charge of his most competent ward sister.

FIG. 2.



Prof. Pirquet with the children in the sanatorium on the roof of the Kinderklinik.

The "Nem" System.

Theoretical objections can be brought against Pirquet's "Nem" system, as for example, in the rejection of the calorie as a measure of nutritive value for a new arbitrary unit—viz., the "nem" or food value of 1 c.cm. milk (0·67 calorie). No one, however, who has seen the "Nem" system in working, can deny its success in practice. For in this system the nutritional value of foods is assessed against a *standard which can be seen and handled.* In the kitchen, where the nursing staff received an important part of their training, the working unit, 100 nems or 1

FIG. 1.

Prof. Pirquet and his assistants at the Vienna University Kinderklinik, 1920–22. (From left to right): E. Nobel (Vienna), K. Kassowitz (Milwaukee), H. Wimberger (Salzburg), Prof. Pirquet, B. Schick (New York), W. König (Vienna), E. Mayrhofer (Zagreb), R. Wagner (Vienna).

hectonem, is visualised as 100 c.cm. of milk, seen in the graduated cylinders which function as the ordinary kitchen measures. The newest probationer soon realises that the addition of 8 g. of sugar or cereal in the preparation of an infant's food increases the food value of the meal by 50 per cent. The dishes destined for the older patients are prepared on similar quantitative lines, and the weighed portions served later in the wards secure that each receives a diet of the calorie value ordered by the physician, with the requisite proportions of fat, protein and carbohydrate.

The practical application of Pirquet's Nem system was fully developed by the end of the war period and was thus available for the time of suffering through which Vienna passed in the years from 1918 to 1922. When in 1919 the mass-feeding of the children was undertaken by the American nation, Pirquet was entrusted with the entire organisation of this gigantic enterprise, which involved the provision of at least one meal daily for 160,000 children of school age. In this work he was untiring, and his energy and hopefulness stood out in marked contrast to the spirit of despair and apathy which, at that period, brooded over the city. He was in truth, a "diffuser of life" in that time of trouble. Any morning, after discharging his duties at the Klinik, the Professor, accompanied by two of his assistants, might be seen hurrying to the headquarters of the "Amerikanische Hilfsaktion." His efficient organisation secured that the general scheme, conceived in the Kinderklinik, was faithfully carried out even in the most distant distributing centre. After a medical examination and assessment of their nutritional state by the series of body measurements laid down in Pirquet's System of Nutrition, the selected children received meals of suitable nem (calorie) value for their age. The kitchens, in some of which 10,000 meals were prepared daily, were run in accordance with the Nem system, directed by well-educated women trained in the kitchens of the Kinderklinik. The system employed is worth the careful study of all interested in school or communal feeding.

The Hospitality of the Kinderklinik.

The hospitality shown to foreign students in the Vienna Kinderklinik under Prof. Pirquet has become proverbial. A striking example is the welcome extended to the group of English women who, under the auspices of the Lister Institute and the Medical Research Council, went to Vienna for the purpose of studying deficiency diseases in the years following the war. Owing to their recent isolation, the Vienna scientists were ignorant of the new work showing the importance of vitamins in nutrition, and Pirquet was no exception, being entirely preoccupied in the quantitive aspect of nutrition, which presented such appalling problems at that time. Nevertheless, the British workers were warmly welcomed and received every assistance in their studies upon scurvy in infants and older children. Later, they were invited to undertake a joint experimental and clinical investigation on rickets and its relation to diet, this disease having become almost universal in the Viennese infants at that time. A complete ward, with nursing personnel and medical supervision, was placed at the disposal of the research, and, in addition, the scheme enjoyed the resources of the perfectly equipped X ray department and the devoted collaboration of the X ray specialist. At one time or another the help of every department of the Klinik and of almost every member of the staff was made available for the work. These privileges were freely given for the space of two years, and researches were thus made possible which surely could hardly have been carried out by guests in any other institution.

The love and devotion which Pirquet inspired in his staff, both medical and nursing, was touching. In his Klinik he was an adored king, yet no detail seemed too trivial for his personal attention, if it afforded an opportunity for some kindly act. He was very fond of children, and a favourite department of his Klinik was the large ward which he arranged on the roof for sanatorium treatment of 150 tuberculous children of all ages. The little patients would remain in this ward for periods extending to a year or more, and their life was arranged with due regard to their education and well-being in every direction. An attractive feature every morning was the long procession of children winding down the staircase from the roof, singing Austrian part songs on their way to the school, which was held in a special pavilion in the Klinik garden. Prof. Pirquet entered into the life and amusements of these children with perfect sympathy, and was often the central figure at their little festivities. At carnival time they, no less than the more fortunate children in the city, must have a party, and the Professor would often put on a fancy dress to add to the joy and gaiety of the gathering.

Prof. Pirquet was a tall handsome man and possessed great charm of manner. He was a fine linguist and spoke English perfectly and idiomatically. In spite of his success and enviable position he remained very simple in spirit and manner, and would display his pleasure at a birthday greeting from one of his small patients no less than when receiving some important honour or distinction from outside. Those who have enjoyed the hospitality of the Vienna Kinderklinik will find it difficult to visualise it without the gracious figure of its well-loved chief.

HARRIETTE CHICK.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Anti-accident Week.

A SO-CALLED Anti-accident Week has just been held in Berlin. Lectures were given in schools, factories, and hospitals on the way to prevent accidents in industry, the home, and the street; special pains were taken with the instruction of children; and posters were seen everywhere in tramways, buses, railway carriages, public buildings, restaurants, and theatres, with advice on how to avoid accidents and on the need for effective first-aid. The cinemas contributed to the campaign by giving special performances. Figures published in the newspapers show that last year there were about 2 million accidents in Germany and that nearly 24,000 of these were fatal, giving an average daily mortality of 64. Thirty per cent. of them occurred in factories, the remainder being in streets and at home. The campaign was carried out under the patronage of the Ministry of Labour, the German Insurance Office, the employers' associations under the Workmen's Insurance Act (Berufsgenossenschaften), and the police.

Combating Noise.

The well-known aurist, Dr. Peyser, lately drew attention in the Medical Chamber to the noise in Berlin and its influence on the health both of the public at large and of individuals. He distinguished three kinds of noise: traffic noise, factory noise, and home noise. Continuous noise in factories leads, he said, to direct injury to the inner ear, whilst noise in traffic and in the home may cause serious disturbance to the nerves of sensitive persons. Most of it can, he thinks, be avoided, and in this connexion he alluded to the police regulations by which motor-cars have to give signals at every street-corner by horns, and to the signals of the fire brigade which consist of a continuous tintinnabulation, together with blasts on a special horn. The use of gramophones and loud-speakers at open windows is a recent but not less disagreeable nuisance. Dr. Peyser said that Berlin was the noisiest city in Europe, and on his suggestion the Chamber adopted a motion inviting the police to take measures against noise, especially in the neighbourhood of hospitals and sanatoriums.

Illuminated Door-plates.

To make it easier to find a doctor in urgent cases the door-plates of medical men in several towns have been lighted at night. This practice has not met with general approval, and in Berlin the Medical Chamber are of opinion that it is contrary to the recognised rules of the profession. They point out that in Berlin medical aid can be obtained in cases of accident through the municipal first-aid stations established throughout the city. In Hamburg a list of doctors prepared to do night service is kept by the police, and patients who want urgent aid have only to apply at the next police-station or approach a police-patrol which will at once fetch the next medical man on the list. It is reported that many of the junior medical men in Hamburg earn a livelihood in this way.

Sleeplessness in School-children.

Herr Klos, headmaster of a Berlin municipal school, says that about a third of the children at his school are still sleepy during the first morning lesson —many of them so sleepy that they cannot follow the lesson at all. On investigation he found that these children, although going to bed very early, are unable to sleep, and he has inquired into the causes of their sleeplessness. The answers were manifold: some complained of the noise of the wireless used by their parents, some of the noise made by neighbours doing night work. On the other hand, some said that the silence of the night made them nervous; they were afraid of burglars or ghosts. Some were disturbed by the light falling through the windows, or by barking dogs, others said that they were still thinking and ruminating upon school and other matters. A good many of the children were regarded as "obviously neurasthenic"; they complained that their bed coverings were too hot, that they had dreams, or that they were sweating and excited. Such cases ought to be examined by the school medical officer, whilst in the others there are external causes to be removed.

The Medical Profession and Trade Tax.

The Government has had the intention of including members of the medical profession among those who are obliged to pay trading tax. This intention has caused some alarm and the medical faculties of the German universities have petitioned against it, saying that in consequence of the measure doctors would be regarded by the public as tradesmen. The tax itself is fairly high but its direct financial effect would bear little proportion to the harm it would do. The Medical Chambers also have protested and it is reported that the plan has been dropped. It may be remarked that the provisions regarding medical practice are all to be found in the Trades Act of 1869, so that the Government's intention is not quite illogical. But the profession has long wanted to have medical practice taken out of the Trades Act and made subject to a special law, as is the practice of law and other liberal professions.

According to a report by Dr. Burgsdorf from the German Statistical Office the fertility of German mothers decreased by 26 per cent. between 1913 and 1926; the 1913 figure was itself 50 per cent. below that of 1875. In 1900 there were still 300 children born from each 1000 married women capable of child-bearing, but the annual figure fell to 138 in 1926. It cannot be expected that this state of things will change in the near future, and Burgsdorf thinks that the average of 3·4 children per married woman is insufficient to maintain the continuance of the German people without being supplemented by illegitimate births.

From an investigation by the German Health Office it appears that some of the cigars advertised and sold as not containing nicotine, or only a small and innocuous quantity of it, have proved to contain more nicotine than ordinary cigars. The advertisement of such cigars may thus be regarded as unfair competition and can be punished by law.

For the sake of rural school-children who often have to go a long way to the next dentist, the provincial school and health authorities of Rhenish Prussia have provided a motor-car fitted out as a dental dispensary. This motor-car contains an operating room with all the necessary dental appliances. The appliances are driven by electricity, the car containing a cable which may be connected with the nearest light cable. There is an appointed school dentist travelling with the car to the different places where the school-children are sent to him for dental examination and treatment.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Deaths of Physicians.

THE American Medical Association has issued its annual analysis of the information derived from obituary notices of its members. The average age at death is found to be 63·1 years, a slight gain on previous years. According to United States life-tables the expectation of life in this country at age 20 was 64·3 years in 1910 and 66·2 in 1922. It would be interesting to see a life-table constructed from the data obtained by the American Medical Association for the 2792 deaths that occurred among its members last year. Heart disease is the leading cause of death as might be expected, since it is overwhelmingly the most important cause in that part of the general community which survive the first two decades of life. It might at first sight seem strange or significant that tuberculosis should take as low a place as eighth on the list. However, if we consult a table showing for the registration States the chances, at a given age, of dying eventually from a given disease,[1] and select the age-group 15–25 (since all doctors must have reached that group before becoming doctors), it appears that here tuberculosis takes seventh place. Using this method of comparison it will be found that the causes of deaths among physicians are not greatly different in their relative importance from the causes of death among their patients.

Ventilation of School Buildings.

When the New York State Commission on ventilation reported six years ago that they had found less respiratory sickness among the children in window-ventilated schools than in the schools that were mechanically ventilated, a controversy was started that has scarcely died down yet. Many States have outlawed the simpler method in their building statutes—and naturally the engineers were not inclined to submit without protest to a decision that seemed to condemn all their efforts. They desired that future investigations should take physical standards (as temperature humidity and air environment) rather than absences of pupils attributed to "colds." However, the public health investigators have remained firm in their contention that the final criterion is the health of the school-child, though they agree to the desirability of measuring the physical conditions and correlating their measurements with the practical findings in health. Subsequent investigations, including one that is just reported by an engineer of the public health service,[2] have amply confirmed the conclusion that window ventilation is associated with a lower rate of respiratory sickness. It is, of course, admitted that what holds true for classrooms is not necessarily true for large halls. Yet there is evidently some factor present in window

[1] Amer. Jour. of Public Health, 1928, xviii., 880.

[2] Greenburg, L.: A Study of the Relationship between Type of Ventilation and Respiratory Illness in Certain Schools of New Haven, Conn. Public Health Reports, 1929, xliv, 285.

ventilation that is either unknown or whose value is not properly appreciated.

Mental Hygiene.

The first international congress of mental hygiene is to be held in Washington, D.C., during the week of May 5th–10th, 1930. The secretary of the American National Committee, Mr. Clifford W. Beers, has been elected secretary-general of the congress. An administration office has been opened at 370, Seventh-avenue, New York City, in charge of Mr. John R. Shillady. British members of the sponsoring committee are Dr. J. L. Birley, Sir Hubert Bond, Dr. A. Helen Boyle, Sir Farquhar Buzzard, The Countess of Chichester, Sir Maurice Craig, Lady (Horace) Darwin, Miss Evelyn Fox, Dr. Edwin Goodall, Dr. J. R. Lord, Dr. H. C. Marr, Dr. Bedford Pierce, Prof. George Robertson, Sir Leslie Scott, Lord Southborough, and Dr. Henry Yellowlees.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Sanatoriums and Tuberculosis.

AT the annual meeting of the Royal National Hospital for Consumption Prof. T. G. Moorhead took the opportunity of suggesting what place sanatoriums should take in the fight against tuberculosis. Recent pronouncements, he said, had led many to think that sanatoriums had become obsolete, but they were still the first line of defence. What had failed had not been the sanatoriums, but the provision of after-treatment. It had been estimated that there were in the Irish Free State 18,000 fewer sufferers from tuberculosis than in 1912, and in the accomplishment of that change sanatoriums had certainly played a part. There was still inadequate sanatorium accommodation. He urged the establishment of a tuberculosis colony in the Free State, but it should not be established in connexion with any single institution, but should be open to patients from all sanatoriums.

The Hospitals and Treatment for School-children.

For some time past negotiations have been going on between the city hospitals and the City Commissioners of Dublin regarding the treatment of school-children for disabilities discovered in the course of medical inspection. The Leinster Branch of the British Medical Association tried to secure unanimity among the staffs of the hospitals about the remuneration they would accept for specific services in the hospitals. Certain grouped hospitals have, however, agreed to conditions which do not meet with the approval of the Leinster Branch, and it is suggested that these terms have been agreed to without the authority of the members of the staffs of the hospitals. At a recent meeting of the branch a resolution was unanimously carried withholding approval of the arrangements on the grounds that the remuneration mentioned was quite inadequate for the services rendered, and that the correspondence submitted to it bore no evidence of the terms having been accepted by the medical staffs of the hospitals concerned.

A Medical Recruit to the Dáil.

Dr. Thomas F. O'Higgins has been elected deputy for the northern division of the city of Dublin by a narrow majority. His entry to the Dáil should add strength to the already important medical group of deputies. Both divisions of the city of Dublin now have a medical man among their representatives. Dr. O'Higgins is a son of the late Dr. T. F. Higgins, of Stradbally, Queen's County, and a brother of the late Mr. Kevin O'Higgins, Minister for Justice. He took his qualifications from the Royal Colleges of Physicians and Surgeons in 1914, and subsequently served for some years in the Royal Army Medical Corps. For the past few years he has been Director of the Army Medical Service of the Irish Free State. He has been a competent administrator, and it is well that while the public loses his services in one capacity it secures them in another.

MEDICAL RESEARCH COUNCIL.

ANNUAL REPORT FOR 1927–28.[1]

THE report for the year 1927–28 to the King in Council from the Committee of the Privy Council for Medical Research incorporates the fourteenth annual report of the Medical Research Council. The total sum at the disposal of the Council last year was £166,000, including the Parliamentary grant of £148,000 and an additional £18,000 from unofficial public and private sources. It is noteworthy that less than 6 per cent. of the total expenditure was spent on administration, that roughly one-third has been allocated to the maintenance of the National Institute for Medical Research and its associated laboratories, and that two-thirds has been paid out in salaries and grants for expenses to workers in other institutions.

Liaisons throughout the Empire.—During the year liaisons have been established or fostered between the Medical Research Council and other official research organisations in the Empire, notably by the visit of their secretary, Sir Walter Fletcher, to India, and by the coöperation of Prof. Lyle Cummins, of the Tuberculosis Committee of the Council, with the corresponding committee of the South African Institute for Medical Research. The National Research Council of Canada is keeping the Medical Research Council informed of the progress of large-scale experiments designed to test the value of the B.C.G. vaccine, and investigations carried out in the colonies, protectorates, and mandated territories is being brought effectively into relationship with those in progress in Great Britain by the work of a newly established Colonial Medical Research Committee. The Empire Marketing Board has coöperated with the Council in investigating the nutritive values of various foodstuffs and products.

It happens that this year the Medical Research Council are able to draw attention to several therapeutic innovations, certain of which are based on work done in their own laboratories or elsewhere under a grant from the funds at their disposal. The great service done by the Council in fostering medical progress is bearing fruit not only in the opening up of new avenues of approach, but in making available for general use the results of scientific investigation at the earliest possible moment, and in the critical examination of new methods of diagnosis and treatment. We summarise below some of their comments on methods of treatment.

COMMENTS ON INNOVATIONS IN TREATMENT.

Pernicious Anæmia.

Referring to the treatment of pernicious anæmia by the administration of liver, the Council note that Minot and Murphy made this discovery by directly applying in hospital practice the results of experiments made with dogs which Whipple and Robscheit-Robbins, of Rochester, N.Y., had just published. Here again, as in so many other instances, the experimental method has brought a practical advance where observational study through all the years had brought none. Here, too, is a fresh instance of service being given to mankind for which the dog was found to be especially fitted.

The coöperation of manufacturing firms was enlisted by the Council as soon as it was established that the unknown factor which effects the cure can be extracted on a commercial scale, and a simplification of the process used in America was worked out

[1] London: H.M. Stationery Office. 1929. Pp. 165. 3*s*.

at the Council's laboratories. As a result extracts of liver of proved potency are not on the market for patients who cannot tolerate a large daily consumption of uncooked liver as such.

Artificial Light.

Medical treatment by artificial ultra-violet light (as distinguished from sunlight) has lately come widely into use in this country with a rapidity not hitherto common even for the best attested therapeutic novelties. Great sums of private and public money are being expended upon it and large new commercial and professional interests are involved. The Council point out that some part of this new use of light has an indisputable scientific basis, but that prolonged researches give no scientific reason to suppose that the supply of vitamin D to the body for the treatment of rickets, or any other purpose, is better effected by ultra-violet rays falling on the skin than by the direct provision of the necessary food values. The use of artificial light to supply only what the right food can give is merely wasteful. It commonly costs three or four shillings to give by light an effective supply of vitamin D that would cost less than a penny if given by the mouth in the form of cod-liver oil or otherwise.

In order to ascertain whether ultra-violet light had any general beneficial effects, two series of controlled experiments were conducted on subnormal infants and on healthy school-children respectively by Dr. Helen Mackay and Dr. Dora Colebrook. In the first series (who were given cod-liver oil to eliminate the purely nutritive factor) no evidence could be found of any gain in weight, of lessened anæmia, or of better resistance to infective illnesses in the treated group as compared with a similar group of untreated children. The "control" group showed indeed rather fewer respiratory infections. In the second series, when conditions between the children with and without the treatment were equalised, the results of the light were wholly negative. It gave no gain in weight, height, or observed mentality or "spirits," and the incidence of minor ailments such as colds was actually rather higher among those receiving the light. The Council are aware of no properly controlled experiments which have been made elsewhere to set against these two series.

The only medical uses of "light" radiations, other than the supply of vitamin D, which have already a basis in physiology depend upon their power of exciting a local inflammatory reaction in the skin, on which power depends Finsen's method of treating lupus. Independently of this, work done in recent years for the Council has shown that light, when it has produced a much weaker inflammatory reaction of a larger area of the skin, indicated by an after-flush, does cause an increase in the power of the blood corpuscles, as tested in shed blood, to dispose of bacteria. But this increased bactericidal power of the blood, as shown in the laboratory, has not yet been correlated with any permanent effects of value in the body, and is quickly followed by a decrease of bactericidal power. Moreover exactly the same effects for good or evil follow inflammation of the skin blood-vessels inflicted by heat or by other irritants than light. There is no present reason to know that artificial light can do more in this way than a mustard plaster, which is indefinitely cheaper.

Dr. Duke-Elder, working at the Royal London Ophthalmic Hospital, has found, like some earlier observers, that direct "local phototherapy" notably hastens the healing of corneal ulcers. There is no equivalent evidence of successful local treatment of skin ulcers.[2] The results of a clinical inquiry recently organised by the British Medical Association on the treatment of varicose ulcers appear to put radiation high in the scale of effectiveness, but evidence is lacking that the high rate of recovery was due to the irradiation and not to the rest and bandaging which, at least in many cases, were concurrently applied.

The Light Committee of the Council have found no reason for weakened confidence in the claims made by a number of distinguished clinical observers for the value of carefully regulated exposure of patients to natural sunlight, especially in such conditions as surgical tuberculosis. However, it cannot be taken as established by scientific evidence that the sole, or even the principal, factor in the benefits obtained by such treatment is the relatively small ultra-violet component of natural radiation from the sun, or that similar benefits can be expected from treatment indoors with ultra-violet rays. In the absence of this evidence it seems fair to suspect that in much of the present advocacy of light treatment the results post hoc are accepted as propter hoc, and beyond that common fallacy there lie all the possibilities of faith-healing and suggestion, as well as those of simultaneous but unnoticed changes in the personal hygiene of those treated. It would seem to be the duty of those who take the responsibility of prescribing light treatment, not only to secure that its known dangers shall be avoided, but also to find and announce evidence of its benefits that do not come only from strong commercial advocacy on the one hand and popular credulity on the other. It would seem also to be the special duty of hospitals and school or other clinics expending large sums of public money upon artificial light to use part of the expenditure to demonstrate by properly controlled trials their justification for spending more.

[2] THE LANCET, 1928, i., 904.

Radium for Cancer.

In a brief review of the progress made during the period of about seven years since the Council was entrusted with 2·5 g. of radium by the Government the outlook has been transformed. In place of random empiricism definite technical methods have now been worked out for the treatment of cancer by radium for almost every region of the body except the stomach.

Modes of application have been devised and improved; problems of dosage in terms of mass of radium, its position, and time of exposure, have been successively brought nearer final solution. The rates of progress have been very widely different at the different hospital centres of work. But the Radiology Committee report that more recently effective effort is being made at "practically every centre," and this is taken as showing that there is now a widening circle of real interest in radium therapy among surgeons. This interest is coupled with the growing conviction that the full value of radium treatment "can only be discovered by exploring all the technical possibilities of radio-surgical access and of variations in dosage." It is already possible to say that any woman suffering from early cancer of the neck of the womb can have the disease locally removed by a course of radium treatment as surely as by the knife, and of course with less suffering and risk. Radium has already proved to be the best means of treating "inoperable" cancer of the mouth or tongue. Its use gives a prospect of cure certainly in excess of that offered by surgical means. In the "operable" cases it seems that it will soon replace excision, for it removes the growth locally without mutilation and with less scarring, and gives a good functional result. Even if the growth should have spread to the glands there is now a good prospect of radio-surgical methods eradicating the disease. Similar confidence is rapidly gaining ground in respect of cancer in other positions—for instance, in the breast in women and in the rectum in men. There is reason, moreover, to feel sure that this progress is only the beginning of an accelerating advance. The stage has been reached when the progress now securely made is undoubtedly stimulating interest and effort in a widening circle, and this will allow the best conditions for more rapid advance on an extended front.

As radium treatment has won its way from inoperable cases to the operable and earlier cases its successes have multiplied and the growth of faith in it has been both justified and accelerated.

If the advances in research work on its clinical side have been tardy here as compared with those over the same period in other countries such as Sweden or France, the reason may lie in the fact that abroad the work has been done at centres where the whole organisation on both its laboratory and its clinical sides has been so arranged as to keep progress by systematised and controlled trials as the prime object in view. For Great Britain the centres have been necessarily arranged chiefly within large voluntary hospitals, where skilled clinicians and pathologists are available together with organised accommodation for patients. The Council had little alternative to this without an expenditure upon a scale for which they

were not even approximately equipped. The great general hospitals, however, do not always offer in their traditions and in their arrangements, personal or material, the best conditions for systematic and rapid advance by research of a clinical kind. In individual hands and at some centres brilliant results have been achieved in recent months.

The public and the profession alike can now perceive that the stage has been fully reached when radium treatment must be put within the reach of all whose lives depend upon it. There is at present a wholly inadequate supply of radium in the country as well as a corresponding shortage of really trained operators and of available hospital beds. But since it will be long before finality in technique is reached, every treatment centre must be a research centre, and vice versa, and therefore in any sound national scheme of treatment most of the existing centres should be retained and expanded, and others established should be closely affiliated to the present centres.

Nephritis.

Prof. S. J. Cowell, then working under Prof. E. Mellanby at Sheffield, continued his researches during the year on the relation of diet to nephritis. He has found that vegetables, and especially summer-grown green vegetables, have a powerful protective influence against inflammatory changes in the kidneys and thereby prevent a high non-protein nitrogen accumulation in the blood. Experiments are being made to determine the exact nature of the protecting agent. Milk or cereal foods have no protecting action.

The work of Dr. A. A. Osman and Dr. H. G. Close at Guy's Hospital on the treatment of nephritis by alkalies has been maintained, and it is believed that in suitable cases this gives a much higher percentage of successful results than any other single form of treatment. Further evidence of the efficacy of alkalies in the treatment of anuria has been obtained, and some light has been thrown on the mode of action of alkalies in causing diuresis. The instability of the acid-base balance is found to be of importance in the causation of acute nephritis. Further experimental evidence has also been obtained that alkalies prevent scarlatinal nephritis.

Dental Disease.

Correlation of animal experiments with findings by Mrs. M. Mellanby goes far to suggest that the fundamental cause of the prevalence of dental caries is a defect of nutrition, and that it may be possible by dietetic measures to check the incidence of dental disease, even in the cases of defective original structure. With Dr. Lee Pattison Mrs. Mellanby has tested the effect of irradiated ergosterol on the initiation and spread of caries in children.

An important investigation has been begun at Birmingham by Mr. A. Deverall and Miss E. Brinton, where children in three institutions are receiving special additions to their ordinary diet with a view to determining the influence of these on the development of teeth and liability to caries. Miss Brinton has been responsible for the distribution of the special articles of diet, for noting any cases where owing to sickness or other cause the diet has been suspended, and for recording the family and personal history of each child, the physical condition (including the transference of notes from medical officers' records), and any personal idiosyncrasies.

Diabetes.

At King's College Hospital, London, Dr. R. D. Lawrence has discovered from recent experimental work that the usually accepted quantitative relationship between insulin and glucose does not exist. The normal ratio of dosage of insulin to carbohydrate used up is found not to hold beyond a certain point. Beyond this, relatively small increments of insulin can enable the body to dispose of increasingly large amounts of carbohydrate. With Dr. Olive Buckley he has investigated the factors, such as septic infections and toxins, which antagonise insulin action, and Dr. Buckley is investigating the eosinophilia which seems to be produced in many diabetics by the continuous injection of insulin. Dr. R. A. McCance has almost completed an analysis of carbohydrate foods which shows that the available carbohydrate of fruits and vegetables is less than has been supposed.

A request was received by the Council for the trial of a proprietary preparation named "Glukhorment." This was alleged to be a preparation from the pancreas containing a natural anti-diabetic principle which, unlike insulin, was effective if given by the mouth. Its use had been supported by Prof. von Noorden, of Frankfurt. Chemical examination by Dr. H. H. Dale and Dr. H. W. Dudley showed that "Glukhorment" contained enough of a substance indistinguishable from "Synthalin" to account for its recorded clinical effects. This finding has been confirmed by workers in Czecho-Slovakia and in Germany and by a clinical trial made by Dr. R. D. Lawrence.

Tuberculosis.

Dr. A. Stanley Griffith, working at the Field Laboratories, Cambridge, has given much of the past year to studies of the immunising value of the B.C.G. vaccine of Calmette and Guérin.

His work has not confirmed the conclusions that the ingestion or inoculation of B.C.G. can give complete protection in monkeys against an infection with virulent tubercle bacilli. With one exception all the vaccinated monkeys became infected and developed progressive tuberculosis. On the other hand, an absolute immunity has apparently been produced in a calf by intravenous inoculation of B.C.G. Experiments are now being made, with Prof. J. B. Buxton, to find the relative values of different methods of giving the vaccine, the most effective dosage, and the duration of the resulting immunity. The experiments completed show that immunity can be produced by intravenous, subcutaneous, or oral administration. Two calves fed by the last method have resisted completely the intravenous inoculation of 1 mg. of virulent bovine bacilli, which would have killed them without it in less than 20 days.

Dr. R. L. Vollum has continued his work on experimental tuberculosis with Prof. G. Dreyer at Oxford. This has been chiefly concerned with vaccination by different methods and after different cultural conditions of growth of the bacilli, followed by estimation of the resulting immunity.

Prof. C. H. Browning has tried to repeat observations by Danish workers on the treatment of tuberculosis by means of injections of metallic salts. Long series of injections of aluminium and manganese chloride were given with a wide range of dosage. So far little influence from the treatment has been observed. In tests with Rupell's serum in tuberculous mice no definite differences could be established between treated animals and untreated controls as regards the character and extent of the lesions or the number of tubercle bacilli present.

Puerperal Fever.

In the attempt to find prophylactic measures against puerperal fever the Council have promoted an extension on a large scale of the investigation Dr. H. Burt-White made in applying the Dick test to women before labour.

It had been shown by Dr. G. H. Eagles and others that a toxin similar to that which reacts in the Dick test for scarlet fever is found in many non-scarlatinal strains, including streptococci from puerperal fever. Dr. Burt-White has found that in a hundred prospective mothers admitted to St. Bartholomew's Hospital and to the City of London Maternity Hospital there was a close correlation between a Dick-positive result and subsequent puerperal sepsis. The correlation suggested so strongly the possibility and wisdom of rendering Dick-positive subjects immune to puerperal fever before labour that arrangements have been made for a thousand cases to be investigated by Dr. B. Jervis at the City of London Lying-in Hospital and Dr. G. Morgan at Queen Charlotte's Hospital, under the supervision of Dr. Burt-White and Dr. L. Colebrook. It is anticipated that a means of prophylaxis may be made available to antenatal cases who are shown by the Dick test to be susceptible to puerperal fever.

In the inoculation department at St. Mary's Hospital, London, Dr. Leonard Colebrook has completed one phase of his investigation of arsenical compounds in relation to the chemotherapy of streptococcus infec-

tions. It remains now to ascertain, by careful clinical trial, how much the streptocidal potency acquired by a patient's blood under the influence of these compounds will contribute towards the prevention and cure of streptococcus infections. These clinical trials have been begun and experimental work is also in progress. The drug used in these trials is a methylene bisulphite compound derived from salvarsan.

Canine Distemper.

Dr. P. P. Laidlaw and Mr. G. W. Dunkin have continued their work to a point when the knowledge acquired is capable of being usefully applied in practice to rendering dogs resistant to infection by distemper. In trials of the method upon over 1000 dogs kept under ordinary conditions, wherever a clear comparison has been possible between inoculated and uninoculated dogs the results have been strikingly successful, and evidence is lacking only as to the duration of the immunity conferred.

At the Tiverton Hunt 62 hounds were inoculated. None had distemper. The disease broke out among the older hounds in the same kennels in December, 1927, but no vaccinated animals took the infection. Four vaccinated animals were sent to a neighbouring kennel where distemper was present, but remained well.

In the Dulverton pack 5 out of 16 young hounds were inoculated, were exposed to infection, but remained well. Of the other 11, 9 took the disease and 3 died. Of hounds belonging to the Puckeridge pack 24 were inoculated. They were exposed to distemper and one contracted a mild form of the disease. Among the uninoculated hounds in the same kennels 70 took distemper and 22 died. In the Warwickshire pack 44 vaccinated hounds were exposed to infection without any taking the disease; 91 unvaccinated hounds kept together with these took distemper, 49 dying.

Apart from foxhounds, about 300 dogs of a variety of breeds have been vaccinated; none has been reported as contracting distemper.

The present method of immunisation is subject to some disadvantages, both as regards manufacture and administration. Further research, for a limited period, is therefore contemplated with a view to possible improvement in these respects. In the meantime, however, it is hoped that the benefits of the work already done will shortly be brought to the dog-owning public in general, and the Council are glad to learn that a commercial laboratory is now actively working towards large-scale production of the vaccine.

Sundry Other Disorders.

Gastro-duodenal Ulceration.—Further work on the intensive alkaline treatment of this condition has convinced Prof. H. MacLean and his colleagues at St. Thomas's Hospital Medical Unit that the method will cure the ordinary case of ulceration, and that surgical interference is entirely unnecessary in uncomplicated ulcers. Patients with adhesions and other complications may fail to respond, but evidence has been obtained which suggests that even cases with adhesions to sundry organs may do quite well. Although over 100 patients were treated during the last year only two required operation; in both cases extensive adhesions were found. The use of sufficient alkali, on the lines described in the published papers, has given excellent results and has enabled most of the patients to continue at work without the usual severe recurrence of symptoms.

Acute Intestinal Obstruction and Peritonitis.—In the Surgical Unit of St. Thomas's Hospital Mr. B. W. Williams has continued work on the clinical investigation of the use of antigas-gangrene sera in these cases with special reference to the efficiency of concentrated globulins. The concentrated serum has been found apparently efficient in counteracting toxæmia in 15 cases, doses of 20 c.cm. being apparently equal to doses of 100 c.cm. of the unconcentrated serum.

Trypanosome Infections.—The trial in experimental trypanosome infections of chemo-therapeutic agents belonging to the amino-styryl-quinoline group has been continued by Prof. C. H. Browning and Dr. R. Gulbransen. It is hoped that one of these may soon be available for testing in natural infections of larger animals. The problem of the treatment of relapses in trypanosome infections has been pursued further in the light of observations that killed parasites do not by themselves give rise to an effective immunity reaction.

At Cambridge Miss M. Vincent and Dr. P. Tate, under the direction of Dr. D. Keilin, are testing the antimalarial effects of various synthetic compounds upon the malarian parasite of canaries.

Oxygen Want.—At Leeds Dr. H. W. Davies, using a simplified form of the Davies-Gilchrist oxygen administration apparatus, has made experiments to determine the effects of subcutaneous and intraperitoneal injections of oxygen upon the oxygen saturation of the arterial blood in conditions of oxygen want. No increase of oxygen saturation could be found, and it is inferred that injection of oxygen cannot relieve oxygen want in human patients.

Graves's Disease.—The relation of Graves's disease to iodine metabolism has been studied by Dr. G. S. Williamson and Dr. I. H. Pearse and colloid secretion has been shown not to be responsible for the toxic factor in this disturbance. Moreover, the danger of thyroxin and iodine therapy in the treatment of simple goitre has become more apparent by studies which have shown that lymphogenic secretion in the thyroid can be stimulated, and toxicity in the gland aggravated or induced by iodine, thyroxin, or thyroid-gland treatment. In individuals of hypothyroid disposition the danger of inducing a permanent lymphocythæmia by these therapeutic measures has become apparent.

Cardiovascular Diseases. — At Manchester Dr. J. Crighton Bramwell and Dr. R. Ellis are studying after-histories of patients suffering from different types of cardio-vascular disease. One group, for instance, consists of 27 cases of auricular fibrillation treated with quinidine for from two to five years.

Amœbiasis.—With Dr. P. P. Laidlaw and Miss A. Bishop, Mr. C. Dobell has maintained the studies already reported upon the value and uses of emetine for destroying the amœba in the human body. Under defined experimental conditions they find that as little as one part of this alkaloid in five million parts of culture medium will kill the amœbæ in vitro. A much improved method has been devised for testing the toxicity of chemical agents upon cultures of the amœbæ.

Epilepsy.—The previous findings of Dr. W. R. Brain, Dr. H. D. Kay, and Dr. S. H. G. Robinson, in the Medical Unit of the London Hospital, that alterations in the level of the blood cholesterol are associated with the fits in epilepitc patients have been confirmed. The oral administration of cholesterol to epileptics has been tried and found to have no therapeutic value, but the evidence that it is absorbed by this route is unconvincing.

Familial icterus neonatorum has been investigated and treated by Dr. A. C. Hampson at Guy's Hospital. Up to the present time 14 cases have been treated with serum—all successfully.

Enteric Carriers.—The investigation under Prof. R. Muir and Prof. C. H. Browning has been continued by Dr. K. Guthrie. Of two intestinal excreters operated on by Mr. Farquhar Macrae the one infected with *B. typhosus* has now consistently failed to show the organism in weekly examinations over a period of five years; the other, infected with *B. paratyphosus* B, has similarly given negative results over a period of three years. Cultures made from the duodenal contents in both cases failed to yield any growth of the specific organisms. These results provide confirmation of the efficacy of operation on the gall-bladder, usually cholecystectomy, in curing the carrier condition in a large proportion of cases.

CANCER AND TUBERCULOSIS:

THE SUPPOSED ANTAGONISM.

THE publication by Prof. Raymond Pearl of a paper entitled Cancer and Tuberculosis in the *American Journal of Hygiene* for January raises once more the question of an antagonism between these diseases. Although a great deal has been written about it, no quite conclusive answer has been given to what seems a simple statistical question. Prof. Pearl has tackled the problem in two ways. An analysis of the admirable autopsy records of the Johns Hopkins Hospital forms the groundwork of his paper, while subsidiary evidence from vital statistical data is also brought forward.

A series of 816 records of persons in whom some form of malignancy was discovered at autopsy was compared with an equally large sample in which there were no signs of new growth. The control group was selected in such a way that each member of the series agreed with one of the malignant series in respect of age, sex, colour and, as far as possible, date of death. From these data the incidence of active and healed tuberculous lesions in the two groups was calculated, and the conclusion is reached that there is a definite incompatibility between malignant disease and tuberculosis, such that the two very rarely occur together in florid activity in the same person. Taking the whole series, only 6·6 per cent. of those with malignant growths showed signs of active tuberculosis, whereas in the controls active lesions were found in 16·3 per cent. This difference between the two groups was found to apply equally when each age, sex, and racial group was subjected to separate analysis. Healed tuberculous lesions, on the other hand, were no less frequent in the malignant than in the control groups.

The problem was then approached from the opposite point of view, and the incidence of malignancy in a series of persons with tuberculosis in any degree of activity was compared with its incidence in a control series either without tuberculosis or with only old healed lesions. Among the actively tuberculous the incidence (28 per cent.) was found to be approximately only half as great as in the controls (53 per cent.). In making the comparison any case with tuberculous lesions which showed even the smallest evidence of activity was relegated to the group "active tuberculosis." This procedure would tend to obscure the inhibitory effect (if any) of active tuberculosis on the development of new growth, and if a series of post-mortem cases in which there was a great deal of active tuberculosis (e.g., acute ulcerative tuberculosis, tuberculous meningitis, vertebral caries) is compared with an adequate control series the difference in incidence should be relatively greater. This proved to be so, for of 886 persons with much active tuberculosis only 11 (1·2 per cent.) showed signs of malignant tumour, whereas in 886 persons of the same age, sex, and racial constitution 82 cases (9·3 per cent.) of malignancy were found. This general result again holds good for each separate age, sex, and colour group.

Malignancy in the control group was thus nearly eight times as frequent as in the series with a great deal of active tuberculosis, whereas when tuberculosis of any degree of activity was compared with controls the incidence in the latter was only twice as frequent. This suggests that there is a simple quantitative relation—that in the inhibition of malignancy it is not only the *presence* but also the *amount* of active tuberculosis which is important, and that the antagonism between the two diseases disappears when the tuberculous process heals or retrogresses.

With such clear autopsy results, it might be anticipated that official mortality statistics would provide valuable confirmatory evidence, and in a sense this is true. Prof. Pearl points, for example, to the higher tuberculosis and the lower cancer mortality in the male sex, the different ages of maximal incidence of the two diseases—tuberculosis being chiefly a disease of early, cancer predominantly one of later life—and the higher tuberculosis and lower cancer mortality in coloured compared with white races. The recorded secular trends and the incidence of the two diseases in the various organs of the body are not inconsistent with the view that antagonism does exist, but are insufficient in themselves to demonstrate causal connexion. More refined analysis of available mortality records only serves to emphasise the need for caution in the interpretation of statistical data. In a series of 22 States of U.S.A. the correlation between mortality from pulmonary tuberculosis at one decade of age in 1910 and that of cancer at the next higher decade in 1920 was determined. Contrary at first sight to what would be expected from the results of autopsy analysis, the correlations are all substantial in magnitude but *positive* in sign, indicating higher cancer mortality in areas with high tuberculosis rates. If mortality is a reasonable index of morbidity incidence this might be interpreted in such a manner that autopsy and official mortality returns would appear to be hopelessly at variance. But Prof. Pearl, rightly more impressed by the autopsy findings, offers an alternative explanation, equally plausible and reconciling otherwise discrepant results. Autopsy data indicate that active tuberculosis alone protects the organism against cancer. If, under prevailing environmental conditions, only a limited number of persons will ever develop florid active tuberculosis, and if the mortality from this cause is very high at any given age, the number left to develop active tuberculosis at later ages will be smaller than if the death-rate previously had been low. Consequently, if antagonism between the two diseases does exist, relatively more persons from a given age-group will reach a later age lacking the protection from cancer afforded by active tuberculosis, and a high cancer mortality combined with high antecedent tuberculosis mortality would result in such a community. Prof. Pearl realises that this is mere hypothesis, and conservatively concludes that official vital statistics present nothing contradictory to the conclusions reached from the more exact autopsy material.

This is probably the most thorough investigation of the problem which has yet been made. It is being followed up by experimental and clinical work, the results of which will be awaited with great interest.

DEATHS IN LONDON STREETS.—Deaths in street accidents in the London area during 1928 numbered 1237, being 181 more than in 1927. In the last quarter of the year the total was 365, or four deaths a day. In 1920 the number of persons killed was 638, in 1925 840, and in 1927 1056. Private motor-cars caused 120 deaths and 11,623 accidents to persons and property, trade and commercial mechanically propelled vehicles 101 deaths and 7318 accidents to persons and property. Of the 365 persons killed, 258 were pedestrians, of whom 126 are recorded to have "crossed the road without due care." The total of drivers and occupants of vehicles who lost lives was 22.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The Fellowship announces that there will be no special courses until after Easter. The first course in April will begin on the 11th and will be a practitioner's course in medicine and surgery at the London Temperance Hospital, lasting two weeks, with daily sessions from 4·0 to 5·30 P.M. The London School of Tropical Medicine has arranged a series of eight clinical demonstrations to take place at 2 P.M. on Tuesdays and Thursdays, from April 9th to May 2nd. A course on treatment by electrotherapy will be given at the Royal Free Hospital on four successive Wednesdays at 5.15 P.M. from May 10th (entries limited to 16). Two courses will begin on April 15th, the first a course at the Royal Waterloo Hospital, in medicine, surgery, and gynæcology, occupying every afternoon, and some mornings, for three weeks, and the second, in neurology, at the West End Hospital for Nervous Diseases, every afternoon at 5 P.M., for four weeks (minimum entry 10). Syllabuses of all courses may be had from the secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

Correspondence.

"Audi alteram partem."

CEREBRAL SURGERY.

To the Editor of THE LANCET.

SIR,—The leading article on cerebral surgery in your issue of Feb. 16th, inspired by Mr. Hugh Cairns's very interesting report on his experiences in Dr. Harvey Cushing's clinic in Boston, must have left a painful and misleading impression on the minds of your readers in regard to neurology in general and neurological surgery in particular as practised in Great Britain. It is my object, if possible, to remove this impression which, it is only fair to emphasise, is not confirmed by a careful perusal of Mr. Cairns's paper.

It is doubtful, for instance, if Mr. Cairns really intended the writer of your leading article to believe that the examination of the fundus oculi, the investigation of the visual fields, and X ray examinations are either "amongst the more recent advances in diagnostic methods" in cerebral tumours, or that they originated in America. Surely they have formed a part of the routine examination of every case in this country for many years past. Ventriculography, on the other hand, is still on its trial and its employment must always add to the sufferings, if not to the dangers, to which the patient is exposed. A false idea of its value may easily be conceived in the absence of adequate experience and skill in the interpretation of symptoms and physical signs. That this is sometimes the case is shown by a quotation from Mr. Cairns's report: "In 1925 Grant published a report of the pooled experiences of the American Society of Neuro-Surgeons. Ventriculography had been used in 392 cases and was held solely responsible for localisation of the tumours in 93 cases, or 30 per cent. of the verified tumours."

As a physician, it would be presumptuous for me to speak too positively, but I should be surprised if my surgical colleagues "read with special interest Mr. Cairns's account of the principles which underlie Cushing's surgical methods—namely, (1) avoiding injury to the brain, (2) hæmostasis, and (3) asepsis and closure of the wound." It would surprise me less if they dubbed such a statement a surgical platitude. But world-wide principles in surgical methods are not infallible, and we learn from Mr. Cairns that "one of the earliest and most frequent complications after operation is the formation of a blood clot between the dura and the overlying bone of the osteoplastic flap. The clot compresses the brain and may be fatal if not discovered quickly."

It has for long been obvious to British neurological surgeons and physicians that a low mortality-rate depends chiefly on two factors: (1) early diagnosis, and (2) the non-gliomatous nature of the tumour. In your leading article appears the remarkable statement: "A low operation mortality-rate justifies early cerebral exploration and so leads to the removal of tumours at an earlier stage of their development than has hitherto been possible"—a unique example of putting the cart before the horse. It is an early diagnosis which justifies early cerebral exploration, with removal of a tumour when it is removable, and so renders possible a low mortality-rate. Moreover, alleviation of suffering and disability, where radical cure is impossible owing to the gliomatous nature of the tumour, is more easily attainable when the diagnosis is made before headache, vomiting, and optic neuritis have become severe, and a high intracranial pressure has increased the dangers of operating. It is a pity that more attention is not drawn, either in Mr. Cairns's paper or in your leading article, to the absence or tardy development of headache and papilloedema in many cases of intracranial growth which are the most amenable to surgical intervention and which are not beyond the powers of neurologists to detect and locate.

My personal acquaintance, during the last 30 years, with the work of Sir Victor Horsley and his disciples prevents my subscribing to the statement that "for many years technique has lagged behind diagnosis in neurological surgery," and I am not satisfied that the results they have obtained have been inferior to those reported from the Boston clinic by Mr. Cairns. The latter's report naturally contains little indication of permanent results in relation to functional efficiency and the statistics he publishes in regard to operative mortality are of little importance for purposes of comparison, in view of the fact that they are based on a series of cases of which nearly 40 per cent. were of pituitary or acoustic nerve origin. It is not fair to Dr. Cushing, therefore, that the writer of your leading article should hail them in these words: "These remarkable figures, which it is safe to say have never been equalled elsewhere, will excite not only admiration but a demand to know how they are achieved."

May I submit very respectfully that surgical technique must always have an individual and personal flavour, and that two surgeons practising with the same principles but entirely different details of technique may attain equally successful results. Dr. Cushing's work has always commanded the deepest respect of his many friends and admirers in this country and he does not need to be told that every detail of his technique is studied with care and interest. While agreeing that "it is well at times to recognise that there are forms of mutual indebtedness between nations which excite no feelings but gratitude," I can hardly believe Dr. Cushing would express his belief in his own methods and his regard for his English colleagues in language such as this: "It is clearly to the patient's interest that Cushing's methods should be practised as widely as possible, though it must not be supposed that English neurology has nothing to contribute to neurological surgery"!

I am, Sir, yours faithfully,

Oxford, March 18th, 1929. E. FARQUHAR BUZZARD.

OPERATING FOR APPENDICITIS.

To the Editor of THE LANCET.

SIR,—Regarding an objection to the delayed system of treating certain cases of appendicitis—viz., that the patient having passed the crisis fails to submit himself for appendicectomy, for three years I have worked on the following plan. As soon as it is evident that resolution of the disease may be confidently expected the patient is handed two cards to sign. On each is printed:—

"I realise that I have just been tided over an attack of appendicitis. The surgeon considered that in my case it was safer to defer operation. I fully understand the danger of leaving the appendix, and I agree (1) to come into hospital on.....; (2) to report at the hospital immediately if I have any symptoms before that date

"Signed, ————."

Before this plan was adopted I found that more than 5 per cent. of the patients who had successfully undergone Ochsner's treatment failed to return. They were written to and a proportion replied with various excuses, the principal being that they had not fully understood the advice. Since the plan has been in operation, in only two instances has the patient neglected to keep the agreed appointment. Two cards are signed: one the patient takes away, the other is indexed and serves to remind the staff of the appointment, which, except in special cases, is made for a date two months after leaving. Experience shows that in the average case an interval of two months is necessary for the products of inflammation to resolve completely. In exceptional cases three months is necessary as Mr. Love emphasises.

I am, Sir, yours faithfully,

HAMILTON BAILEY.

Edgbaston, Birmingham, March 17th, 1929.

GAMMA RADIATION.

To the Editor of THE LANCET.

SIR,—The note by Mr. Wakeley and Dr. Colwell on the radium treatment of cancer of the rectum in your last issue conveys the impression that the treatment described by them is entitled to the heading "gamma radiation." The authors emphasise "gamma radiation" not only in the title of the note but in stating: "It is clear from the filtration that the neoplasms were subjected only to gamma radiation." After careful perusal of the article we think that the method described hardly comes under the heading of "gamma radiation." The tubes used contained 50 mg. of radium sulphate; the length of the tubes is not stated, but screened by 1 mm. of platinum and rubber tubing they will only give pure gamma irradiation if their linear intensity is about 1 mg. of radium per cm. length. In that case the containers would have to be about 50 cm. in length, an impossible proposition.

We presume that the length of the torpedo-shaped containers was commensurate with the length of the growth attacked, perhaps 4 or 5 cm. The linear intensity of such tubes screened as described is such that pure gamma radiation is out of the question, unless placed at a considerable distance (10 cm. or more) from the growth which is impossible when applied within the lumen of the rectum. Radium therapy as practised by Mr. Wakeley and Dr. Colwell has produced necrosis in a large number of cases, owing to a combination of beta and gamma radiation. This can be achieved much more rapidly and with less expense by diathermy.

At the present time, when much public attention is focused on the possibilities of radium treatment of cancer, it seems to us that the note by Mr. Wakeley and Dr. Colwell is calculated to mislead some workers in the field who may not be aware that gamma therapy acts by dissolution and absorption rather than by destruction through necrosis (beta radiation), which causes great suffering to the patient. Gamma irradiation given with efficiently screened tubes of suitable intensity over prolonged periods of time produces no ill-effects and does not lead to necrosis, although it is not claimed that it is always curative.

Clinical experience leads us to believe that the importance of adequate screening is not always sufficiently appreciated and further, we believe that heavier screenage than is usually employed with needles at the present time will result in improvement in clinical results, and this is our excuse for criticism on this occasion.

We are, Sir, yours faithfully,

C. GORDON-WATSON,
STANFORD CADE.

London, W., March 16th, 1929.

GLASS-WORKERS' CATARACT.

To the Editor of THE LANCET.

SIR,—Your annotation of March 9th (p. 513) gives an incorrect account of the discovery of glassworkers' cataract in this country. I was the first to describe the peculiar features of this disease in the *British Medical Journal* of Jan. 24th, 1903. It was my paper that directed Sir Thomas Legge's attention to the subject as he afterwards told me; and it was I who first showed the small Home Office committee consisting of Dr. G. J. Burch, Mr. Marcus Gunn, Mr. W. Anderson (all of whom are now dead), Mr. (now Sir) Herbert Parsons, and Dr. Legge the first 10 cases of the disease they had ever seen. These I demonstrated to them in the Sunderland Eye Infirmary. The circumstances were set out in a paper read before the Oxford Ophthalmological Congress in July, 1915, and published in *The Ophthalmoscope* for November, 1915.

I am, Sir, yours faithfully,

WM. ROBINSON.

Sunderland, March 10th, 1929.

THE INJECTION TREATMENT OF VARICOSE VEINS.

To the Editor of THE LANCET.

SIR,—If I write you again on the subject it is chiefly that I may make brief reference to the courteous letter of Sir Sidney Alexander, with whom I think I had some private correspondence on the subject a year or two ago, and who, as one of the earlier exponents of the injection method, and, so far as I know, one of the most temperate of its advocates, is entitled to have due weight given to the views he may express thereupon.

Sir Sidney quotes at some length from an appreciative letter, testifying to the great benefit derived by one of his patients from the injection treatment, after extensive operative treatment by excision and ligation had failed to cure. Though I might point out that the testimony of the patient seems to have been given too soon after the injection treatment (1926), and there is no later testimony as to the permanency of the benefit, I would not seek to labour unnecessarily this defect in the proof. Even accepting the case, however, at the value at which Sir Sidney assesses it, I might suggest that, if the injection treatment can ever be justified, probably this was the type of case that might most reasonably be submitted to it; a case, that is to say, where the extensive previous operations had presumably shut off most, if not all, of the avenues for systemic dissemination of clot. In other words, Sir Sidney carried out the injection treatment under conditions in which the risk of embolism had been very substantially lessened. If I were inclined to admit the justification of the injection method under any circumstances whatever, I should probably find the justification in such circumstances as were present in this case.

One further reference to Sir Sidney's letter. He points out that I seem to think "that a large number of cases of varicose veins do not require treatment." That is correct, but surely such a view is common to all. I might even assume that Sir Sidney shares this opinion. We may differ in view as to the relative proportion of cases that require treatment, but surely no one has reached the position yet where one might say, "Hello! Here is a varicose vein; let's inject it." Further, I must insist on the undesirability of meddling with the "odd superficial vein causing no trouble whatever, but perhaps showing as a bluish streak, &c." The type of vein to which I have referred is, in the great majority of cases, not a varicose vein at all; nor has it any very great tendency to become varicose. Such visible, but in no way disfiguring, superficial venules are to be seen in a very large proportion of women, and even in men, and they generally give no trouble—unless to the vanity of the flapper. It is surely not our duty to pander to this vanity.

May I take this further opportunity of restating the chief points in my case against the injection method? It seems necessary to get back to fundamentals—to general principles. In my official capacity I have the duty of teaching the student of surgery, and I am bound to teach him what I believe to be basic principles—principles, that is to say, which have a certain fixity or stability, though varying deductions may be made from them by different people. I endeavour to approach the subject of the injection method of treatment from this standpoint, and I would state my case against the injection method in the form of four questions.

First, is thrombosis, or is it not, a thing that the surgeon is justified in deliberately inducing under any circumstances?

Second, does the thrombus induced in the injection method differ, in any real essential that may be relied upon from the thrombus we so much dread as an accidental happening in surgery?

Third, are we able, as surgeons, to say with confidence that it will behave differently?

Fourth, can we confidently assure our patients that there is no risk attached to the injection method of treatment?

And, remember, it is the patient who has to take the risk.

I am bound to say that up to the present I have been unable to answer any of these questions except in the negative, and accordingly I am quite unable to commend to my students the injection method of treatment of varicose veins, nor would I like to appear, by my silence, to assent to the thesis put forward by the writer of the annotation that prompted my original letter—namely, that the case for the injection treatment is now proved beyond question.

I am, Sir, yours faithfully,

ARCHIBALD YOUNG.

The University, Glasgow, W., March 11th, 1929.

THE PREVENTION OF INFLUENZA.

To the Editor of THE LANCET.

SIR,—Regarding the value of quarantine regulations in the prevention of influenza (discussed in a leading article in your issue of March 2nd), may I state that during the pandemic of 1918 the late Dr. F. E. Rainsford, then medical superintendent of the Stewart Institutions for Imbeciles and the Hospital for the Insane, Palmerston House, Co. Dublin, called together the staffs of both institutions and suggested they should not go into the City or infected areas during their leave. He also prohibited all visiting, and every care was taken with admittance of food. The result was, his was the only institution in the United Kingdom and Ireland which had no case of influenza, owing to his continuous watchfulness night and day.

I am, Sir, yours faithfully,

E. A. RAINSFORD.

Kingstown, Co. Dublin, March 10th, 1929.

CHRONIC CARBON MONOXIDE POISONING.

To the Editor of THE LANCET.

SIR,—I am trespassing on your space in order to draw the attention of a wider audience to a series of troubles caused by fumes which have recently come under my notice.

In the first category, I have come across lately a number of cases showing headache, fatigue, dizziness, irritability, emotional disturbances, and gastric symptoms, which have been promptly relieved by a change of air, only to relapse when the patient has returned to her original surroundings. In one of these cases, at any rate, it has been found that there was a small leak of gas in the bedroom of the patient, and her symptoms, which had been previously regarded as neurotic, disappeared completely following the repair of this leak. In another case the patient always felt giddy after a bath; the bathroom was very small and the hot water was supplied by a geyser which was fitted with an effective vent-pipe. The room, however, was poorly ventilated and rapidly became full of steam. It was the patient's habit, contrary to instructions, to leave the geyser on during the time he had his bath, and there was ineffective combustion due to clogging of the burners. These symptoms also rapidly cleared up following attention to this point. In another group of cases I have had examples of men who spent a large part of their day in closed saloon cars fitted with an imperfect exhaust. These men have suffered from symptoms thought to be neurotic, but which have cleared up when attention has been drawn to this possible cause. Chronic carbon monoxide poisoning affects the highest centres first, producing fatigue, irritability, and emotional disturbances as the earliest symptoms.

I am mentioning these points because chronic carbon monoxide poisoning is not an uncommon event in my experience. The acute cases are readily recognised, but these chronic cases, in which the subject inspires small quantities of carbon monoxide gas over a long time, may easily escape notice or thought to be of a psychic origin. It has been pointed out by Glaister and Logan that an ordinary 20 h.p. motor-car will produce in five minutes sufficient gas in the exhaust to make the atmosphere of a small garage noxious, and the writer has personal experience of severe headache following whiffs of exhaust gas which are occasionally met with in London traffic blocks. It might be of interest to note that analysis of the air round Vauxhall and in Paris shows that a small percentage of carbon monoxide is occasionally present.

The treatment for the conditions is not by drugs except in a secondary capacity, but consists in replacing the amount of available oxygen which is lost to the body by a combination of hæmoglobin with carbon monoxide. This, of course, can be done either by a change of air immediately or by inhalation of oxygen and 5 per cent. carbon dioxide through a properly fitting inhaler. In the writer's experience, which is detailed at length in a recent paper on fume diseases to the Medico-Legal Society, this condition is commoner than is generally supposed.

I am, Sir, yours faithfully,

GERALD SLOT, M.D.

Harley-street, W., March 8th, 1929.

NOISE AND ANNOYANCE.

To the Editor of THE LANCET.

SIR,—I have read your article in THE LANCET of to-day's date with pleasure, but I would like to give you the true history of the campaign against noise so far as the British Medical Association is concerned. I was the first to bring the matter as a public health problem before the Public Health Committee of Edinburgh Town Council. The committee was quite in agreement with my view that noise should be treated as a nuisance within the meaning of the Public Health Act (the Scottish Act is the latest for 1897). I then brought the subject before the Division and Branch of the B.M.A. here, and they agreed upon the resolutions which were adopted at the Cardiff Annual Meeting. The Town Council of Edinburgh is now promoting a Provisional Order, and there is to be a clause in it dealing with noise. This will come before Parliament at an early date.

You will see from the above facts that I have played a rather important part in getting public opinion, and especially medical opinion, to bear on the question. I gladly acknowledge the part that Prof. Spooner and Dr. Dan McKenzie have played in the initial and present stages of the propaganda.

I am, Sir, yours faithfully,

Edinburgh, March 16th, 1929. T. G. NASMYTH.

ERRATUM.—In an article on the use of avertin for anæsthesia by Dr. J. Blomfield and Dr. F. E. Shipway, which appeared in our last issue, the word *omnopon* was printed in two places as omnoform.

LIVERPOOL FOOT HOSPITAL.—This institution was opened only at the end of October, but it has treated 1369 patients, and a third operating room is already needed. The work is restricted to the alleviation of minor foot troubles; patients who require surgical treatment are recommended for admission to a general hospital.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL.—This hospital has decided to purchase a site of five acres on the Goldhawk-road, near Ravenscourt Park Station, in the borough of Hammersmith. Building will soon begin on the first section of what it is hoped will ultimately be the largest maternity hospital in the Empire. Mr. Edwin Stanley Hall, F.R.I.B.A., has been appointed architect, and the first section of the work to be carried out will be that of a separate isolation block, with research facilities for patients suffering from puerperal fever. Such cases will be received in large numbers, and laboratory research and the training of post-graduate students and midwives will be based upon the study of them.

Public Health Services.

INFLUENZA.

CLINICAL reports indicate that the epidemic has now passed its maximum in most districts of England and Wales. An increase in the number of cases is reported from Birmingham and Shrewsbury, and the incidence is still high round Norwood and Selhurst and on the Hampshire borders of Surrey. There is also considerable prevalence in Nottingham, Lincoln, Grimsby, Doncaster, Sheffield, Leeds, Bradford, and other West Riding towns, as well as in Norwich, Newmarket, Buckinghamshire, and South Wales. A definite decline is reported from Manchester, Liverpool, and other Lancashire towns, Newcastle, and South Shields, as well as in London, Reading, Portsmouth, and Southampton. The disease is mostly mild but a certain amount of pneumonia is reported from some of the larger towns, as well as from Radstock in Somerset. In Grimsby many cases are proving rapidly fatal from acute œdema of the lungs. On the continent the epidemic has apparently reached its maximum in Northern France and the Rhine area, while it is on the wane elsewhere.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 9TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 289; scarlet fever, 2215; diphtheria, 1137; enteric fever, 28; pneumonia, 5818 (last week 5874); puerperal fever, 42; puerperal pyrexia, 131; cerebro-spinal fever, 15; acute poliomyelitis, 6; acute polio-encephalitis, 2; encephalitis lethargica, 28; dysentery, 8; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week. It will be seen that the notifications of pneumonia have not quite reached the level of the previous week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on March 12th–13th was as follows:—Small-pox, 88 under treatment, 9 under observation; scarlet fever, 1708; diphtheria, 1876; enteric fever, 8; measles, 81; whooping-cough, 1119; puerperal fever, 18 (plus 8 babies); encephalitis lethargica, 78; polio-myelitis, 7; "other diseases," 68. At St. Margaret's Hospital there were 11 babies (plus 6 mothers) with ophthalmia neonatorum.

The increase of 54 in the number of small-pox patients under treatment or observation in M.A.B. Hospitals is a corollary of the fact that cases of small-pox are being reported from many of the metropolitan boroughs—namely, in the week under review, from Bethnal Green, 1; Finsbury, 3; Islington, 1; Lambeth, 1; Poplar, 5; St. Pancras, 1; Southwark, 3; and Stepney, 3; while East Ham reported 2 and West Ham 43 cases.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 88 (1) from measles, 10 (3) from scarlet fever, 250 (74) from whooping-cough, 42 (5) from diphtheria, 65 (9) from diarrhœa and enteritis under two years, and 2127 (312) from influenza. The figures in parentheses are those for London itself.

The number of deaths from influenza during the previous eight weeks was 122, 179, 321, 652, 987, 1243, 1764, and 2183 respectively, the figures for London during the same weeks being 34, 39, 77, 198, 331, 393, 473, and 424. It will be seen that the peak has been passed, not only in London, but in the country as a whole. In the week under review deaths were, however, attributable to influenza in Birmingham, 266; Sheffield, 114; Leeds, 94; Stoke-on-Trent, 80; Bristol, 58; Manchester, 55; Bradford, 54; Leicester, 39; Oldham and Hull, each 36; Walsall, 35; Bolton and Middlesbrough, each 31; while 11 other towns reported between 20 and 30 fatal cases. Deaths from whooping-cough are still widely distributed, the highest figures coming from Manchester, 14; Bolton, 13.

The number of stillbirths registered during the week was 288 (corresponding to a rate of 38 per 1000 births), including 52 in London.

Death-rates from Influenza for the Last Six Weeks.

The course of the influenza epidemic in different parts of the country is indicated by a table which was printed in our issue of March 2nd (p. 471) and the figures of which are here brought up to date.

Week ended—	Aggregate.	North.	Midlands*	South*	Wales.	Greater London
Feb. 2nd, 1929..	1·73	2·14	0·48	2·56	0·53	1·89
,, 9th ,, ..	2·56	2·96	0·77	2·64	0·80	3·20
,, 16th ,, ..	3·29	3·54	1·84	2·00	0·94	4·34
,, 23rd ,, ..	4·67	5·19	3·84	3·52	1·20	5·35
Mar. 2nd ,, ..	5·78	6·26	7·57	4·52	1·87	5·04
,, 9th ,, ..	5·64	5·87	9·67	2·96	2·54	3·97

*Excluding Greater London.

The Registrar-General also compiles the annual death-rates last week for the aggregate of great towns and for some of the largest of these, to illustrate the effect of the present epidemic. They are as follows: 107 great towns, 31·4; London, 28·9; Birmingham, 49·1; Liverpool, 20·4; Manchester, 28·7; Sheffield, 41·3; Leeds, 38·9; Bristol, 34·1; and West Ham, 26·5.

Obituary.

WALTER JAGGER, M.B., C.M. EDIN.

Dr. Jagger, who died at his home in Upper Berkeley-street on March 16th after a short illness, was well known to Edinburgh graduates in London, for he was for many years one of the secretaries of the Edinburgh University Club and an amusing speaker at the Club dinners in London. A native of Shrewsbury, he was educated there, going on to Edinburgh where he qualified in 1896. Joining the Royal Army Medical Corps, he served throughout the South African War, being awarded both Queen's and King's medals. On his return he went into general practice, after having first qualified himself by a series of appointments at Great Ormond-street, the Samaritan Hospital for Women, and the Lincoln County Hospital. During the late war he was on the staff of Princess Christian Hospital for Officers and the hospitals of the Royal Flying Corps in Eaton-square and Bryanston-square. He had a large practice in Mayfair, and his skill in midwifery was recognised by a command to assist at the birth of Princess Elizabeth. As a member of the Council of the Harveian Society he kept in touch with the medico-political problems of the day. Dr. Jagger married Muriel, daughter of Evelyn Rich, who survives him.

WILLIAM WRANGHAM, O.B.E., M.D., M.R.C.P. LOND.,

Dr. Wrangham, who died suddenly on March 6th, was one of the best known practitioners in Bradford. He came of a Lincolnshire family, members of which for several generations had been medical practitioners. His father was a doctor in Lincoln and his brother is Dr. J. M. Wrangham, of Ripponden. Born in 1871, he received his medical education at St. Bartholomew's Hospital and qualified in 1896. After spending nearly four years as a hospital resident he took his M.D. Lond. degree in 1900. Early in the century he settled in Bradford and was soon appointed assistant surgeon to the Royal Eye and Ear Hospital and assistant honorary physician to the Royal Infirmary, to which at the time of his death he was senior physician. He was also chief police surgeon and medical adviser to the Municipal Mental Deficiency Committee. When in 1915 the poor-law hospital was equipped as the Bradford War Hospital he was

appointed commanding officer with the rank of Lieut.-Colonel, and four years later was decorated for his services and received a personal letter from the General commanding the Northern Division congratulating him on the excellence of his administration of the hospital. When, in the following year, St. Luke's Hospital, Bradford, was established as the first municipal hospital in this country, Wrangham was appointed senior visiting physician. In 1921 he became a member of the Royal College of Physicians of London and relinquished general practice. From that time until his death he had had a large and steadily increasing consulting practice, and general practitioners found in him not only a very capable diagnostician, sound in prognosis and helpful in suggestions for treatment, but also a man of the highest probity, who was most honoured and respected by those who knew him best. Dr. Wrangham leaves a widow and two daughters.

ARNOLD WILLIAM MONTFORT AUDEN, M.B. EDIN.

Dr. Arnold Auden, who died on March 6th after a few days' illness, was the eldest son of the Rev. William Auden, vicar of Church Broughton, Derbyshire, and was born in 1863. He was educated at Shrewsbury School where he achieved considerable success as an athlete, winning amongst other events the school steeplechase and the quarter mile. In addition to being "gentleman of the runs," he was a sound football player and rowed in the school eight for two years. On going up to Clare College, Cambridge, he continued his rowing career, rowing in the Clare boat for the three years of his residence, and being boat captain in his last year. After taking the classical tripos in 1886, he took up the profession of teaching, but after some experience as a schoolmaster he decided to study medicine. Accordingly, he went up to Edinburgh University where he graduated as M.B., C.M. in 1895. After a short experience of practice at Shildon, County Durham, he settled down at Leigh, where he spent the rest of his professional life. A man of splendid physique, Dr. Auden devoted himself heart and soul to the demands of a wide and exacting practice, ever ready to help with generous charity the needy and impoverished of his neighbours. He took no part in public affairs, finding in his professional practice a sufficiently heavy call upon his energies and interests. He was unmarried.

ENCEPHALITIS LETHARGICA IN MANCHESTER.—The Manchester Corporation Public Health Committee has instructed the medical officer of health to ascertain whether the local authorities of South Lancashire would be willing to coöperate with Manchester in preparing a scheme for the treatment of persons suffering from encephalitis lethargica. The Ministry of Health has issued a circular urging all public health authorities to make special provision for such cases in their respective areas. The Manchester Committee had before them a report showing that while some cases are treated by the guardians in Swinton House and some in the ordinary ward of their institutions, there are other patients suffering from serious after-effects of the disease for whom additional accommodation is required.

DONATIONS AND BEQUESTS.—Dr. Oliviera Castro, of Portugal, has given £1000 to the Queen's Hospital for Children, Hackney-road, London, for the purpose of endowing a cot which will bear the following inscription: In memory of Eduardo A. Oliviera Castro, December, 1893, aged 14 years. This cot has been endowed in perpetuity by his father, Dr. Oliviera Castro, as a remembrance, and as a token of sympathy with suffering children amongst the English people, this most cultured and admirable nation. —Among other bequests, the late Mr. Thomas Arthur Springman, of Hampstead, left £5000 to the Royal Northern of Hospital Holloway-road, N.—Mr. Joseph John Johnstone, Craighead, Newport, Fife, left, among other bequests, £1000 each to the Dundee Royal Infirmary and the Royal Victoria Hospital, Dundee.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT BILL.

ON Thursday, March 14th, the House of Lords considered the Local Government Bill on Report.

Administrative Schemes.

On clause 4 Lord COZENS-HARDY moved an amendment providing that the administration scheme should deal with the discharge of transferred functions and with any other similar functions now performed under the various Public Health Acts. The amendment was negatived on Lord ONSLOW'S representation that the present system should be trusted to carry out the functions satisfactorily. The portion of the amendment which might relate to the functions of hospitals, poor-law infirmaries, and cottage hospitals came up for discussion immediately after, upon an amendment moved by Lord HANWORTH to substitute for Clause 13 (Consultation with Bodies Representing Voluntary Hospitals) the following clause:—

"The Council of every county and county borough shall, after consultation with such body or persons within the county or county borough as represent the voluntary hospitals in the area, including representatives of the medical and surgical staffs of any voluntary hospitals in the area, make such arrangements as they think desirable for carrying into effect the functions transferred to them under this Part of this Act with respect to the provision of hospital accommodation and treatment."

"Accommodation" and "Treatment."

The omission of the original clause was agreed upon, and an interesting discussion ensued when Lord ONSLOW supported the amendment, which it will be seen provided for consultation with the representatives of the voluntary hospitals upon treatment as well as upon accommodation. Lord HANSWORTH pointed out that, if any question arose as to what body in a particular county be representative of the voluntary hospitals, the decision might be left to the Ministry of Health, a provision to that effect being inserted in the Bill.

Lord KNUTSFORD then spoke warmly on the question of treatment, drawing a vivid picture of the difference in the service at present provided at the large voluntary hospitals and at the poor-law institutions, while Lord BLEDISLOE gave further support to the amendment by pleading the cause of the cottage hospitals, pointing out in particular the work in treatment carried on by clinics in connexion with small village hospitals under the Education Act, 1921.

Lord DAWSON pointed out the large responsibility which would be undertaken by the new bodies when they entered the field of curative mdicine, as neither the county councils nor the medical men who advised them would have adequate experience of hospital administration for carrying on the new duties, and he suggested that it was the sense of the Committee that help should be brought to them not by compulsion but by conference with the voluntary hospitals and the staffs attached to them, and also with that part of the profession which had always dealt with curative medicine. "There should be," he said, "brought to the aid of these new hospitals the traditions, experience, and knowledge of the voluntary hospitals that had existed for generations, forming an organic nexus between the doctors and the hospital managers." The term "accommodation" to his mind meant fabric and arrangement of buildings, while the term "treatment" covered the purposes for which the structures were used. There was no suggestion that medical men or representatives of hospital managers were coming in at all times to interfere in the new hospitals, but it was meant that real conferences should take place to determine action not only in respect of the buildings to be put up but in respect of the purpose for which they were to be used. He was informed that the best way of providing this was to insert the words "and treatment," but he was wedded not to those words, but to the principle that those who had acquired experience through generations should be able to bring it to the aid of less experienced bodies and individuals. He drew an eloquent picture of the work of a general hospital in support of his contention, giving an illustration of the perils that might surround the ill-advised use of radium, and asked the House not to be satisfied with the mere question of accommodation and fabric, but to ensure that there should be conferences and consultation with the medical profession over the purposes for which the institutions were to be used. If Lord Onslow's clause met the situation why should not this fact be stated in plain English, while scepticism was caused by the fact that the medical profession had not been consulted in drawing up the poor-law part of the Bill. There had here been

no consultation with the heads of his profession. Surely, he said, it would have been natural to have called these heads together and to have said, "We are thinking of giving powers of general treatment to these new county hospitals; can you help us, can you give us advice, and draw up a scheme? We do not, of course, commit ourselves to accepting it." It was because there has been no proper consultation of that sort on the part of the Minister of Health that he was a little sceptical when he found that the Government's clause gave them nothing but a barren concession as to hospital accommodation and contained no words which said that the medical profession should be consulted as to the purpose for which that accommodation was used.

The New Clause.

The Earl of ONSLOW had on the paper the following proposed new clause:—

"The council of every county and county borough shall, before making provision for hospital accommodation in discharge of the functions transferred to them under this Part of this Act, consult with such committee or other body, if any, as they consider to represent both the governing bodies and the medical and surgical staffs of the voluntary hospitals providing services in or for the benefit of the county or county borough."

This clause he understood to meet Lord Dawson's views in regard to any question as to the body representing the voluntary hospitals in an area. He alluded to the number of local committees existing under the Voluntary Hospitals Commission, while the Hospital Association had also a network of committees which would be at the disposal of the local authority, these committees being admittedly formed of laymen. His lordship did not agree that it would be advisable to refer to the Minister of Health questions that might arise locally, as to whether the British Hospitals Association or the Voluntary Hospitals Commission should be selected, as he thought that matter could be left to local discretion. Referring to Lord Dawson's criticisms he considered that if the word "accommodation" was too narrow the same might be said of the word "treatment"—or they might both be termed too broad, for the inclusion of the word "treatment" would place the local authority under the obligation to consult a committee in respect of the medical treatment of patients.

Lord DAWSON proposed that if the word "treatment" could not be inserted the following words might be accepted—"hospital accommodation and the functions to which the accommodations shall be assigned," a suggestion that Lord Onslow said he was prepared to accept and one which fell in with the views of Lord Atkin.

The LORD CHANCELLOR pointed out the inadvisability of placing county councils under a statutory obligation to take advice from the voluntary hospital body with regard to treatment. Lord Dawson, he said, described this thing as the last that he desired, and their lordships would be wise not to insist on putting in words which apparently no one desired. He was sure that words could be devised to carry out Lord Dawson's contention, and he thought it possible to accept the Government clause with the understanding that before the third reading the Ministry of Health would make an effort, in discussion with Lord Dawson and those whom he invited to coöperate, to find what words would have the effect of bringing in the functions to which "accommodation" could be assigned, without implying interference with matters of detailed treatment. Lord Hanworth's clause being rejected by 52 to 42 votes, Lord ONSLOW moved the Government's new clause in the text given above.

An amendment by Lord DAWSON to add to the consultative bodies "the medical faculty of any university which serves the area, and the duly qualified medical practitioners in the area," was negatived.

Recovery of Expenses.

In a discussion upon the recovery of expenses Lord COZENS-HARDY moved the following new subsection:—

"Provided that any such council or authority may, by agreement with the governing body of any association or fund established for the purpose of providing benefits to members or other beneficiaries thereof, accept from the association or fund, in respect of the expenses incurred by the council or authority in the maintenance of any member or beneficiary of the association or fund, payment of such sums as may be provided by the agreement, in lieu of recovering the whole or any part of the said expenses from the member or beneficiary, or from any person legally to maintain him."

This was agreed to and the Report stage of the Bill was closed.

LOCAL GOVERNMENT (SCOTLAND) BILL.

On Tuesday, March 19th, in the House of Lords, the Earl of AIRLIE, Lord-in-Waiting, moved the second reading of the Local Government (Scotland) Bill. Earl BEAUCHAMP moved the rejection of the Bill. The motion for rejection was negatived by 66 votes to 22, and the Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 13TH.

Sick Leave among Women Clerks.

Mr. KELLY asked the Minister of Pensions what was the average number of days of sick leave per head during each of the last three years in the case of women clerical officers, writing assistants, and members of the established typing grades, respectively, employed in his department; and what was the average number of days of sick leave per head in the case of each of the grades concerned taken on account of gastric or nervous trouble, respectively.—Major TRYON gave the information asked for in the first part of the question in the following table:—

—	Year ended Dec. 31st.		
	1926.	1927.	1928.
Clerical officers	9·3	12·7	12·1
Writing assistants	10·9	13·9	11·2
Typing grades	8·1	8·4	11·8

The figures exclude cases of officers whose sick absence amounted to 91 days and over.

The information asked for in the last part of the question was not readily available and could not be obtained without a detailed investigation.

Mr. KELLY asked the Home Secretary a similar question in regard to women clerical officers on the next day.—Sir WILLIAM JOYNSON-HICKS gave the information asked for in the first part of the question in the following table:—

—	1926.	1927.	1928.
Clerical officers	6·1*	6·7*	5·6
Writing assistants	6·2	6·0	4·4
Typing grades	10·9†	10·0	7·6

* Does not include one woman who had 284 days continuous sick leave in 1926 and 1927.

† Does not include one woman who had 105 days sick leave.

He was unable to give the information asked for in the last part of the question.

Mr. KELLY also asked the Under Secretary of State for India a similar question in regard to the women clerical officers in his department.—Earl WINTERTON replied: The following table gives the desired information:—

Year ended Jan. 31st.	Average number of days per head.								
	Sick leave.			Taken on account of gastric trouble.			Taken on account of nervous trouble.		
	Clerical officers.		E.T.G.	Clerical officers.		E.T.G.	Clerical officers.		E.T.G.
	M.	W.		M.	W.		M.	W.	
1927 ..	11·6	18·4	12·4	0·6	2·2	5·0	2·8	0·2	0·4
1928 ..	8·9	9·6	10·1	0·2	1·1	1·5	0·3	2·7	1·3
1929 ..	10·2	15·1	11·4	1·0	0·2	0·2	2·6	1·8	0·2

M., men; W., women. E.T.G., established typing grades.

Mr. KELLY also asked the Secretary for Mines a similar question with regard to the women clerical officers in his department.—Commodore KING gave the information asked for in the first part of the question in the following table:—

—	Year ended Jan. 31st.		
	1927.	1928.	1929.
Clerical officers—Men	6·43	9·77*	6·03
Clerical officers—Women ..	9·20	8·00	11·00†
Established typing grades ..	8·82	5·31	5·65

* Includes three cases of sick leave amounting to 64, 67, and 89 days respectively.

† Includes one case of sick leave amounting to 49 days.

The information asked for in the last part of the question could not be supplied as no detailed record was kept of the types of illness which accounted for the sick leave.

Chlorodyne as a Drug of Addiction.

Viscountess ASTOR asked the Home Secretary whether he was aware that fresh evidence as to the use of chlorodyne as a drug of addiction had come to light since the departmental committee on morphine and heroin addiction reported in 1926; whether, in view of the consequences of the abuse of this drug by persons being able to obtain unlimited quantities by purchase from several chemists at the same time and in the same town, he would bring the preparation within the scope of the Dangerous Drugs Acts; and, failing this action, whether he proposed at an early date to carry out Recommendation 103 (2), which would secure that no preparation could be sold under the name of chlorodyne which contained more than 0·1 per cent. of morphine.—Sir WILLIAM JOYNSON-HICKS replied: The recommendation of the Rolleston Committee has been under consideration, but legislation would be required in order to give effect to it. No opportunity for this has so far occurred, but the matter has not been lost sight of, and it is noted for consideration in connexion with the general question of the revision of the Pharmacy Acts which has been under investigation by a Departmental Committee. I may add that the evidence before the Home Office does not show that the abuse of chlorodyne has been increasing since the Rolleston Committee reported.

Medical Men and Lunacy Certification.

Dr. VERNON DAVIES asked the Minister of Health if his attention had been drawn to the fact that, owing to a recent High Court case, medical men would not run the risk of certifying insane people, and if he proposed to introduce legislation to deal with this situation, which was inimical to the best interests of the afflicted persons and the public.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend's attention has been drawn to this case. He hopes that any legislation which may be introduced to amend the Lunacy Laws will include a provision giving effect to the recommendation of this point of the Royal Commission on Lunacy and Mental Disorder.

Tenure of Office of Public Health Officers.

Dr. VERNON DAVIES asked the Minister of Health if his attention had been drawn to the decision of Mr. Justice McCardie in the King's Bench Division in Brown *v.* Dagenham Urban District Council, which affected the security of tenure of public officials by allowing their dismissal at any time at the pleasure of the body employing them, irrespective of any contract as to notice of termination of appointment; and what action he proposed to take to secure the position of officers appointed under the Public Health Acts in view of the state of the law revealed by this decision.—Sir KINGSLEY WOOD replied: My right hon. friend is aware of this case, and the matter is receiving his consideration.

THURSDAY, MARCH 14TH.

The London Lock Hospital.

Mr. PETHICK-LAWRENCE asked the Minister of Health whether he proposed to publish the report of the committee appointed to inquire into the London Lock Hospital.

Mr. ARTHUR GREENWOOD asked the Minister of Health whether, in view of the appeals being made on behalf of the London Lock Hospital and the public anxiety concerning it, he would, for the guidance of the public, publish the report of the committee of inquiry appointed early last year.—Mr. CHAMBERLAIN replied: I am glad to have this opportunity of explaining to the House that I have brought the recommendations of the Committee of Inquiry to the notice of the Board of the Hospital, and have received an assurance, which I accept, that they have already applied themselves to the task of carrying the greater part of the recommendations into practical effect. This task must involve a comprehensive review of the constitution and management of the hospital. A considerable time will therefore be required to complete it, and I do not think it would be in the public interest to publish details of arrangements at the hospital which are already under revision by the responsible governing body, if and so long as I remain satisfied that the extent of the changes made, and the rate of progress in making them, are reasonable.

Insurance Companies and Health Benefits.

Mr. COMPTON asked the Minister of Health whether there were any regulations under the national health insurance system whereby an insurance company with an approved society branch had authority to deduct the premiums due on the insurance policy from any benefits that might be payable.—Mr. CHAMBERLAIN replied: No, Sir. Any such compulsory deduction from the benefit due to an insured person under the National Health Insurance Act would be contrary to an express provision of the Act.

Health Insurance Benefit.

Mr. DAVID GRENFELL asked the Minister of Health if he would give the figures showing the number of weeks for which health insurance benefit had been paid from 1921 to the last available yearly record.—Mr. CHAMBERLAIN replied: Exact particulars are not available as to the number of weeks for which sickness benefit is paid under the National Health Insurance Act, and the following figures for England and Wales from 1921 to the latest year available, estimated from the amount paid each year for sickness and disablement benefits, can only be regarded as rough approximations.

Year 1921 .. 19 million weeks	Year 1925 .. 25 million weeks
,, 1922 .. 19½ ,, ,,	,, 1926 .. 28½ ,, ,,
,, 1923 .. 20½ ,, ,,	,, 1927 .. 30½ ,, ,,
,, 1924 .. 23½ ,, ,,	

Protection against Anthrax.

Mr. DAY asked the Minister of Health whether his attention had been drawn to an inquest held at Liverpool on March 6th on William Ronald Williamson, a tannery labourer, who died from anthrax; and, in view of the jury's recommendation in this case, if he would consider amending the present law so that in all places where anthrax was likely to be contracted arrangements would be made in order that all suspected cases could be examined and given serum if necessary at any hour of the day or night.—Sir WILLIAM JOYNSON-HICKS (Home Secretary) replied: I have received a report which shows that the death was not due to any lack of facilities for the appropriate treatment, but to the fact that the case was not suspected to be anthrax. A warning as to the dangers of anthrax and as to the necessity for immediate recourse to medical examination is required by Home Office regulation to be posted up in every works of this kind, and I am assured that supplies of the serum are available in all centres where the industries which are subject to this risk are carried on. The warning notice which I have mentioned also enumerates the places at which the serum can be obtained, so that even in the case of isolated factories a supply can always be made available in a few hours. The important thing is that any worker in the industry who is suffering from a boil or pimple or anything that may possibly be anthrax should obtain medical advice and treatment at once.

TUESDAY, MARCH 19TH.

Medical Examination of Emigrants.

Sir JOHN MARRIOTT asked the Secretary for Dominion Affairs how many of the families or individuals who, since January, 1928, had applied for assisted passages to Canada and Australia had failed to satisfy the medical or other requirements of the Dominions; and how many, having satisfied those requirements, had been refused an assisted passage by the Dominion authorities and the Imperial authorities, respectively.—Capt. MARGESSON (Lord of the Treasury) replied: The Dominion authorities are unable to furnish the information asked for in the first part of the question. As regards the second part, no applicants are refused assisted passages if they satisfy the medical tests, and also fulfil the other requirements of the Dominion Governments—that is to say, are going to approved employment and are likely to succeed in that employment.

BIRMINGHAM CONTRIBUTORY SCHEME.—The first complete year's working of this scheme has produced £157,000. In 1927 the Hospital Saturday Fund, which has been taken over as the industrial branch of the scheme, raised £66,000. The number of contributing firms has increased from 2637 to 4219, and the contributions in the factories and workshops have been standardised at 2*d.* per week in place of the varying amounts formerly paid. There are 330,000 contributory members.

ST. ANDREW'S HOSPITAL, DOLLIS HILL.—The annual report of this hospital, which is held in trust by the trustees of the Roman Catholic diocese of Westminster, and is specially intended to meet the needs of the professional and middle classes who cannot afford nursing-home costs, shows that the accommodation is being heavily taxed. Although there is no out-patients' department, more than 300 accidents and other urgent cases have had to be attended. A new pavilion with two wards and 24 beds and an operating theatre is being erected and the building of a nurses' home has been begun. The extensions will cost £30,000, of which only £7274 is as yet available.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At an ordinary meeting of the Council on March 14th Sir Berkeley Moynihan, the President, in the chair, the diploma of Fellow was conferred upon Ian Douglas Miller, Sydney Univ. and Guy's, who passed the examination in November last and has now complied with the by-laws. The diploma of Member was also conferred upon W. F. Skaife, Oxford and St. Bartholomew's Hospital.

Licences in Dental Surgery were conferred upon the following 31 candidates, who have passed the requisite examinations and have complied with the by-laws of the College:—

A. N. Bery, Univ. Coll.; T. Dagger, M.R.C.S., Liverpool; F. W. Entwistle, Manchester; S. P. Ellis, Guy's; F. G. Evans, Royal Dental; T. H. Felton, Manchester; L. W. G. Fisher, Guy's; H. L. Hale, Royal Dental; Alice M. I. Halsall, Royal Dental; C. Haskins, Bristol; J. E. M. Hennessey, London; O. B. Heywood, Royal Dental; O. M. H. Jones, Guy's; B. Joseph, Royal Dental; H. I. Leon, London; B. Lubner, London; C. D. Malone, Guy's; B. Margand, Univ. Coll.; K. S. Morris, Guy's; Irene Piperno, Royal Dental; R. V. Shepperd, King's Coll.; M. Smith, Manchester; F. H. B. Spence, Guy's; R. Symmons, Guy's; R. M. Tompkins, King's Coll.; T. E. K. Uren, Guy's; T. L. Vaisey, Guy's; B. R. Vincent, Univ. Coll.; W. N. L. Wade, King's Coll.; J. W. Woolley, Guy's; and J. L. Young, King's Coll.

The undermentioned diplomas were conferred (jointly with the Royal College of Physicians) upon the following candidates:—

Diploma in Tropical Medicine and Hygiene.—K. P. Anklesaria, F. C. K. Austin, T. C. Backhouse, R. Bandyopadhyay, S. Batchelor, P. S. Bell, D. D. Bhargava, W. K. Blackie, J. S. Brown, J. Bryant, J. A. Carman, Irene E. Chandler, A. D. Charters, L. S. Chatterji, N. Chilton, H. L. Chopra, J. C. Chukerbutti, N. E. Cook, M. Das, P. T. J. Doss, A. N. Duggal, D. P. Dutta, J. G. Green, H. E. Hargreaves, E. Haworth, R. S. F. Hennessey, H. Joomye, N. Kamchorn, Y. M. Khan, C. E. M. J. Libert, G. A. Messih, G. W. Milledge W. S. Nealor, S. L. Rikhye, S. F. Russell, E. H. Stahly, R. Stanford, Eileen M. Turner, G. G. Udeshi, Alice E. S. Wharton, J. B. A. Wigmore, A. J. W. Wilkins, Cicely D. Williams, and D. B. Wilson.

All of these candidates pursued a course of study at the London School of Hygiene and Tropical Medicine, except J. B. A. Wigmore.

Diploma in Ophthalmic Medicine and Surgery.—S. Annaswami, Y. P. Bedi, G. R. Bhatia, M. D. Bower, G. A. Bradshaw, C. S. Colvin, H. V. Coverdale, H. N. Dewan, Jean M. Dollar, J. B. Dhaubhoora, E. H. W. Elkington, W. D. Hamilton, M. Husnain, Audrey H. Henson, S. J. A. Laubscher, A. A. El. M. Magraby, Sigrid L. S. Pearson F. E. Preston, Gertrude E. Pugmire, B. W. Rycroft, A. E. M. Soliman, A. D. C. Stoute, Annie V. Taylor, Marjorie P. Taylor, and G. Vaishnavi.

UNIVERSITY OF LONDON.—At a meeting of the Senate on Feb. 20th it was resolved:—

(1) That the Department of Hygiene and Public Health at University College be closed on July 31st, and that the work for the Diploma in Public Health and for post-graduate and research students in hygiene hitherto carried on in that department, in conjunction with that in bacteriology carried on in the University College Hospital Medical School for candidates for the D.P.H., be transferred as from the same date to the London School of Hygiene and Tropical Medicine.

(2) That the teaching of Epidemiology and Vital Statistics for the D.P.H. be transferred to the London School of Hygiene and Tropical Medicine as from August 1st, 1929.

(3) That the teaching of, and direction of research in, Epidemiology and Vital Statistics, except for the D.P.H., at present undertaken by a Reader at University College, be continued in the Department of Applied Statistics and Eugenics at University College.

(4) That the Department of Municipal Engineering at University College be reorganised and as from August 1st be known as "The Department of Municipal Engineering and Hygiene."

It was also resolved that a degree of Ph.D. be instituted in non-clinical subjects for external students in the Faculty of Medicine, and that candidates for this degree be required to hold, in a branch of study akin to that in which they propose to proceed to the Ph.D. degree, the degree of M.B., B.S., or B.D.S., or B.Pharm., or B.Sc.

A course of lectures on mental deficiency, supplemented by a course of clinical instruction, will be held at the central buildings of the University from May 27th to June 1st, the arrangements being made by the Council of the Central Association for Mental Welfare in consultation with the University Extension Board. Besides the usual course it is proposed to hold a course in a second week (June 3rd to 8th), which will be open to those who have taken the ordinary course in this or some previous year, mainly for members of the School Medical Service, for the purpose of studying exceptional conditions closely allied to mental deficiency, with practical work including case conferences and discussions on cases presenting conduct difficulties. Full particulars may be had from Miss Evelyn Fox, c/o The University Extension Department, University of London, S.W. 7.

ROYAL DENTAL HOSPITAL OF LONDON: SCHOOL OF DENTAL SURGERY.—A course of post-graduate lectures will be given at this hospital at 6 P.M. on Wednesdays, April 10th and 24th, and the first three Wednesdays in May.

RADIOLOGICAL DIAGNOSIS OF RESPIRATORY DISEASE. A practical course on the Radiological Diagnosis of Pulmonary Tuberculosis and Disease of the Respiratory Tract will be held at Strasbourg from June 24th to 30th, under the auspices of the Faculté de Médecine and the Association Alsacienne et Lorraine contre la Tuberculose. The number of participants is limited to 15, and application may be made to Dr. E. Vaucher, 8, quai Finkwiller, Strasbourg.

ROYAL LONDON OPHTHALMIC HOSPITAL. — The Gifford Edmonds Prize in Ophthalmology has been awarded to Mr. V. M. Métivier, of the Ophthalmic Department of Edinburgh Royal Infirmary, for an essay on the Causation and Differential Diagnosis of Proptosis. The prize was founded by Miss Sophie Edmonds in memory of her brother, who fell at Magersfontein. It is valued at £100 and is awarded every second year.

SCHOLARSHIPS AND GRANTS IN AID OF RESEARCH.—The Council of the British Medical Association is prepared to receive applications for an Ernest Hart Memorial Scholarship of £200 per annum, and three Research Scholarships, each of £150 per annum. These are given to candidates qualified to undertake research in any subject relating to the causation, prevention, or treatment of disease. Each is tenable for one year, from Oct. 1st, and scholars may be reappointed for not more than two additional terms. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may hold a junior appointment at a university, medical school or hospital, provided its duties do not interfere with his work as a scholar. The Council is also prepared to receive applications for grants for the assistance of research into the causation, treatment, or prevention of disease. Preference will be given, other things being equal, to members of the medical profession and to applicants who propose to investigate problems directly related to practical medicine.

Applications for scholarships and grants must be made in prescribed form not later than May 25th. Particulars may be had from the Medical Secretary, at the Association's House, Tavistock-square, London, W.C. 1.

ROYAL SOCIETY OF MEDICINE.—The Society's house and library will be closed from Thursday, March 28th, to Tuesday, April 2nd, both days inclusive.

ROYAL NAVY MEDICAL CLUB.—The annual dinner of this club will be held at the Trocadero Restaurant, Piccadilly-circus, on Thursday, April 25th, at 7.30 for 8 P.M. Members who wish to be present are asked to inform the hon. secretary, at Queen Anne's Chambers, Tothill-street, London, S.W. 1, not later than April 17th.

LION HOSPITAL AID SOCIETY.—At the annual dinner of this society last week it was stated that last year £4500 was distributed to hospitals; when it was established 30 years ago the income of the first 12 months was £80. At the dinner £1600 was raised.

SEAMEN'S HOSPITAL SOCIETY. — At the annual court of governors last week Sir Arthur Clarke, the chairman, stated that the beds in the society's seven establishments now number 627. There was an adverse balance of £2000 on the year's working at the Queen Alexandra Memorial Hospital for Seamen at Marseilles, which became one of the society's hospitals at the beginning of 1928.

ST. MARK'S HOSPITAL.—The Lord Mayor of London, Sir Kynaston Studd, accompanied by the Lady Mayoress and the Sheriffs, visited the City-road on March 15th to attend the annual meeting of St. Mark's Hospital. He said that the number of patients admitted last year was 820, and that nearly 900 operations had been performed. The hospital had been enlarged, and the number of beds increased to 72, with a resulting increase of work in all departments, so that further extensions were already necessary, including additional accommodation for nurses, a second operating theatre, and an extension of the cancer research laboratories. These extensions would entail an expenditure of £30,000. Mr. J. P. Lockhart-Mummery spoke of the hospital's supply of radium. Hitherto this had been very meagre, but now, as the result of the generosity of one individual and the allocation of the King Edward's Hospital Fund, St. Mark's had possession for the time being of 250 mg.—enough to treat five patients every fortnight. It could, of course, utilise further supplies.

The Services.

ROYAL NAVAL RESERVE OF OFFICERS.

Surg. Sub-Lt. G. H. Bradshaw to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. F. A. H. Clarke, having attained the age for compulsory retirement, is placed on retd. pay.

Maj. and Bt. Lt.-Col. H. H. A. Emerson to be Lt.-Col., vice Lt.-Col. F. A. H. Clarke.

The undermentioned Lts. (on prob.) are confirmed in their rank: L. R. S. MacFarlane, W. F. Lane, C. L. Day, A. T. H. Marsden, G. L. Grieve, L. R. H. Keatinge, and W. D. Hughes.

Lt. S. M. Burrows is secd. for duty with the Sudan Def. Force.

Lt. J. M. Ryan is secd. under the provisions of Art. 205, Royal Warrant for pay and Promotion, 1926.

Temp. Lt. H. S. Littlepage relinquishes his commn.

J. Ryan and E. S. O'Sullivan to be temp. Lts.

J. M. Ryan to be Lt. on prob.

ARMY DENTAL CORPS.

W. A. McClelland, W. B. Martin, and J. A. McKillop to be Lts. (on prob.).

RESERVE OF OFFICERS.

Lt. S. P. Wilson, from Sup. Res. of Off. R.A.M.C., to be Capt.

TERRITORIAL ARMY.

Hon. Maj.-Gen. Sir Cuthbert S. Wallace (late R.A.M.C.) to be Hon. Col. R.A.M.C. units 47th (2nd Lond.) Div.

ROYAL AIR FORCE.

Temp. Lt. G. M. Titterington, Dental Surg. (temp. Flying Off., R.A.F.), relinquishes his commn.

The name of Squadron Leader H. L. Burton has been brought to notice by Air Vice-Marshal Sir Edward L. Ellington, Air Officer Commanding, British Forces in Iraq, for distinguished services rendered in connexion with the operations against the Akhwan in the Southern Desert, Iraq, during the period November-May, 1928.

INDIAN MEDICAL SERVICE.

Capts. Durgadas Sanyal, Shaikh Mohamed Afzal Faruki, Bhaskar Balwantrao Gadgil, Fazal-ud-Din, Phanindra Nath Basu, Haji Mahommad Salamat Ullah, and Ranjit Sen to be Majs.

Lt. V. A. Edge to be Capt. (prov.).

Maj. A. E. Grisewood, retd., has been granted the rank of Lt.-Col.

Col. F. G. Proudfoot, Asst. Dir. of Med. Servs., 48th (S. Midland) Div., T.A., is apptd. Hon. Surg. to The King, in succession to Col. T. Kay, K.H.S., T.A., ret.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 25th.—8 P.M., ODONTOLOGY. Casual Communications: Mr. C. H. Howkins: The Dental Aspects of Radium Treatment. Mr. J. B. Parfitt: A Compound Composite Odontoma. Demonstration: Mr. E. C. Sprawson: Some specimens from the Dental Museum of the London Hospital. (Illustrated by lantern slides.)

TUESDAY.—5 P.M., MEDICINE. Short communications dealing with various aspects of Gastric Chemistry. Dr. Leonard Parsons: The Significance of Achlorhydria in Infancy and Childhood. Dr. S. W. Patterson: The Pathology of Gastric Secretion. Dr. T. W. Turner and Dr. J. F. Venables: The True Frequency of Hyperchlorhydria in Duodenal Ulcer. Dr. T. L. Hardy: The Rôle of Hydrochloric Acid in the Causation of Gastric Pain. Dr. W. M. Roberts: The Effect of Oils on Gastric Secretion. A Discussion will follow.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE and NEUROLOGY. Special Discussion on Encephalomyelitis of Man and Animals. Openers: Mr. I. A. Galloway (Comparative Medicine). Dr. J. Godwin Greenfield (Neurology). Dr. W. Russell Brain, Dr. Tom Hare, Mr. Leslie P. Pugh, and others will also speak.

The house and library of the Royal Society of Medicine will be closed from Thursday, March 28th, to Tuesday, April 2nd—both days inclusive.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, March 25th.—8.30 P.M., Discussion on the Medical Indications for the Induction of Abortion and Premature Labour, introduced by Mr. Eardley L. Holland, Dr. B. T. Parsons-Smith, and Dr. Bernard Hart.

HUNTERIAN SOCIETY.

MONDAY, March 25th.—8.30 P.M. (at Simpson's Restaurant, 2 and 3, Bird-in-Hand Court, 77 Poultry, Cheapside). Discussion on: Blood Pressure in Health and Disease. To be opened by Dr. Halls Dally, Dr. Edgar Obermer, and Dr. Temple Grey.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

WEDNESDAY, March 27th.—4.15 P.M. (at St. John's Hospital 49, Leicester-square, W.C.), Clinical Cases.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, March 26th.—5 P.M., Dr. R. A. Young: A Medical Review of the Surgery of the Chest. (Third Lumleian Lecture.)

WEST LONDON POST-GRADUATE COLLEGE, Wes London Hospital, W.

MONDAY, March 25th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Dr. Trevor Davies: Gynæcological Department.

TUESDAY.—2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Mr. MacDonald: Genito-urinary Department. 2 P.M., Mr. Bishop Harman: Eye Department.

Medical and Surgical Out-patients, Operations, Special Departments, daily, 10 A.M. to 5 P.M., Saturdays, 10 A.M. to 1 P.M. Courses in Anæsthetics and Operative Surgery.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, March 25th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, March 26th.—3.15 P.M., Dr. W. R. Reynell: Demonstration of Neurological Cases.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, March 28th.—4 P.M., Dr. Schlesinger: Jaundice.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, March 26th.—5 P.M., Dr. H. MacCormac: Malignant Growths of the Skin.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, March 26th.—4.15 P.M., Mr. H. H. Rayner: Cancer of the Colon: Signs and Symptoms and Results of Operation in a series of 60 cases.

Appointments.

GILFILLAN, S. I., M.B., C.M. Edin., has been appointed Medical Superintendent, Bailbrook House Mental Hospital, Bath.

SAVAGE, RONALD, M.B., Ch.B. Aberd., F.R.C.S. Edin., Aural Surgeon at the Lewisham Treatment Centre (L.C.C.).

Certifying Surgeons under the Factory and Workshop Acts: CARTER, R. H., L.R.C.P. Lond., M.R.C.S. (Waltham Abbey District); GARDNER, G. R., L.R.C.P. Edin., L.R.C.S. Edin., L.R.F.P.S. Glasg. (Hyham Ferrers, Northampton); MACKAY, H. A., M.B., Ch.B. Aberd. (Bucksburn, Aberdeen)

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.

Bangor, Carnarvonshire and Anglesey Infirmary.—H.S. £200.

Basingstoke, Hants, Park Prewett Mental Hospital.—Jun. Asst. M.O. £350.

Beit Memorial Fellowships for Medical Research.—Jun. Fellows. £400.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. Also Asst. H.P. Each at rate of £100.

Bexhill, Borough of.—M.O.H. £800.

Birmingham, Queen's Hospital.—Dental H.S. At rate of £50.

Bournville Works.—M.O.

Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.

Cardiff, King Edward VII Welsh National Memorial Hospital.—Area Tub. Phys. £750.

Cardiff Union, City Lodge Institution.—Third Asst. Res. M.O. At rate of £150.

City of London Hospital for Diseases of the Heart and Lung, Victoria Park, E.—H.P. At rate of £100.

Coventry, Coventry and Warwickshire Hospital.—Hon. Physician.

Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £100.

Durham County Council.—District Tuber. M.O. £600.

East London Hospital for Children, &c., Shadwell, E.—Res. M.O. £200. Also Res. H.S. and Cas. O. Each at rate of £125.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Asst. Obstetrician.
Evelina Hospital for Children, Southwark, S.E.—H.S. £120.
Exeter, Royal Devon and Exeter Hospital.—H.P. At rate of £130.
Fiji, Gilbert and Ellice Islands Colony.—M.O. £600.
Golden-square Throat, Nose and Ear Hospital, W.—Registrar. Also Clin. Asst.
Hereford, Herefordshire General Hospital.—H.S. £150. Also H.P. At rate of £100.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.
Hull Royal Infirmary.—Third H.S. At rate of £150. Also Hon. Phys.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool Port Sanitary Authority.—Asst. Port M.O. £700.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.
London Temperance Hospital, Hampstead-road, N.W.—H.P. At rate of £100.
Maidstone, West Kent General Hospital.—H.S. £220.
Metropolitan Ear, Nose and Throat Hospital, Fitzroy-square, W.—H.S. £150.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Sen. Res. M.O. At rate of £140. Also Jun. Res. M.O. and Asst. Cas. O. Each at rate of £100.
Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Res. Med. Asst. £350.
Norwich, Norfolk and Norwich Hospital.—Two H.S's. Each £120.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Asst. Surgeon.
Penshurst, Cassel Hospital for Functional Nervous Disorders, Swaylands.—Res. M.O. £350.
Plymouth, Central Hospital, Lockyer-street.—Hon. Surgeon.
Poole Borough and Port of.—Asst. M.O.H. £600.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Anæsthetist. £20. Also Hon. Dermatologist.
Princess Louise Kensington Hospital for Children, N. Kensington. H.P. At rate of £75 to £100.
Royal National Orthopædic Hospital, 234, Great Portland-street, W. Hon. Asst. S.
St. Pancras Hospital, 4, King's-road, N.W.—Jun. Asst. Med. Supt., &c. £350.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Clin. Assts.
Sheffield, Royal Infirmary.—Surgical Registrar. £200.
Southampton, Administrative County of.—M.O.H. £1250.
Stoke-upon-Trent Union, London-road Institution.—Deputy Res. M.O. £400.
Swansea Hospital.—H.S. £150.
Tunbridge Wells and Counties General Hospital.—H.S. £160.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Hon. P. or S. for Diseases of the Skin.
Walsall General Hospital.—Jun. H.S. At rate of £100.
West Bromwich and District General Hospital.—H.S. At rate of £200.
Western Skin Hospital, 44, Hampstead-road, N.W.—Hon. Asst. Dermatologist.
Willesden General Hospital, N.W.—Res. H.S. At rate of £100.
Wolverhampton, Royal Hospital.—Res. M.O. At rate of £150.
York, Maternity Hospital and Sanatorium.—Res. M.O. £350.

Births, Marriages, and Deaths.

BIRTHS.

DANSIE.—On March 13th, at Welwyn, Herts, to Marion and Charles Dansie—a son.

DAY.—On March 10th, at Norwich, the wife of Dr. George H. Day, of a son.

HORSFORD.—On March 13th, at Harley-street, W., the wife of Cyril Horsford, M.D., F.R.C.S., of a son.

SHAW.—On March 15th, the wife of Maurice E. Shaw, M.D., of a daughter.

SHELDON.—On March 17th, at a nursing home, the wife of Wilfrid Sheldon, M.D., 22, Wimpole-street, W.1, of a daughter.

DEATHS.

BROWNE.—On March 11th, 1929, at 49, Belgrave-road, S.W.1, James Browne, M.D., aged 69.

BURFIELD.—On March 17th, at Grenofan, Heathfield, Sussex, Thomas Burfield, M.A., M.B.

JAGGER.—On March 16th, after four days' illness, from pneumonia, at his home, Upper Berkeley-street, Portman-square, Walter Jagger, M.B., C.M. Edin.

ORME.—On March 17th, Marie Orme, M.B.E., L.R.C.P.I. & L.R.C.S.I., of Rockside, Matlock, widow of the late Albert L'Estrange Orme, L.R.C.P.I. & L.R.C.S.I. Funeral at Matlock Parish Church, Thursday, March 21st, at 2 P.M.

SHAW-MACKENZIE.—On March 10th, 1929, Charles Frederick Dillon Shaw-Mackenzie, M.B. Edin., fourth son of the late Charles Forbes Wodson Shaw-Mackenzie, of Newhall, Ross-shire.

WALE.—On March 9th, at St. Matthew's-drive, St. Leonards, Malcolm E. H. Wale, L.R.C.P., M.R.C.S.

YOUNG.—On March 12th, suddenly, James Martin Young, M.D., C.M.Aberd., of Calthorpe-road, Edgbaston, Birmingham.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

MAINTENANCE OF LIFE IN ISOLATED MUSCLE.

THE EFFECTS OF ANOXÆMIA.

IN the course of his Ludwig Mond Lecture on the Maintenance of Life and Irritability in Isolated Animal Tissues, delivered at Manchester University on March 6th, Prof. A. V. HILL, F.R.S., justified the use by physiologists of isolated tissues for the study of the problems of the living animal. In medical and physiological progress, he said, improvement in knowledge comes, as it does in chemistry and physics, by the isolation of variables, by studying phenomena in as simple a form as possible, as far removed as may be from the complexity of normal life. He recognised, however, the danger that those who work under artificially simplified conditions may, in their enthusiasm, extend their results too far to practical problems.

He went on: "The greater danger—I speak with feeling—is that their friends, and the daily press, may do so for them. If you describe how a nerve-fibre maintains the electrical potential difference at its boundary by an active process involving the consumption of oxygen, you may find your name in all the newspapers, and be invited to America to raise people from the dead; if you prove that chemical disintegration sets in, in a stimulated muscle deprived of oxygen, you may be charged with attempting to create a living cell (and indeed a living "soul") in the laboratory. There is a real danger, and we academic people must beware of applying our results too far."

With this cautionary preamble Prof. Hill returned to the most difficult problem of all—the cause of a phenomenon which he discovered in 1927—and what follows is in his own words.

About this phenomenon, I speculated last summer, perhaps rather rashly, in the Proceedings of the Royal Society. I say rashly, partly because my paper provoked—via Prof. F. G. Donnan—somewhat undue interest in the public press, partly because the explanation I originally gave may not be sufficient. The facts, however, seem certain and are these. By improvement in technique, which I need not describe now, the rate of resting heat production of a muscle can be measured, in oxygen or in nitrogen. The muscle lies upon the warm junctions of a thermopile, in a thermostat maintained at a constant temperature within a thousandth of a degree, in nitrogen which has been freed from oxygen by passing it over hot copper in a quartz tube. The rate of the resting heat production at 18° C. is (say) 60 g. cm. per gramme per minute; about 1½ thousandths of a calorie. The muscle has previously been washed for some time in salt solution, so that it does not now become spontaneously inexcitable in the manner described by Dulière and Horton. It is stimulated and gives a series of twitches; the heat due to activity is registered by the galvanometer attached to the thermopile; stimulation ends; the galvanometer returns; we should expect it to return, gradually of course, to its original position, the muscle to revert to its original heat-rate. Nothing of the kind. Let me illustrate what happens by a typical experiment:—

Time: A.M. or P.M.	11·56	11·59	12·1	12·2	12·3½	12·5	12·6
Galvanometer deflection: mm.	22	23½	23½	22½	22½	24	23

The muscle was then stimulated by single shocks to fatigue; the galvanometer deflected, and when the stimulation ended, returned to rest once more.

Time P.M.	12·20	12·23	12·25
Galvanometer deflection: mm.	130	130	130

The resting heat-rate in this case has been increased between five and six times. The phenomenon has never failed to appear, and it occurs always in the same quantitative form. The quotient

$$\frac{\text{increment in heat-rate per minute}}{\text{total heat by stimulation}}$$

is always (in the frog's sartorius at 17° C.) of the order of 0·0075. The high heat-rate induced by stimulation is permanent so long as the muscle remains in nitrogen. It may attain 800 g. cm. per gramme per minute after severe fatigue, over 1 calorie per g. per hour. It may remain at this level so long as the muscle is kept in nitrogen, for 24 or even 48 hours, in which time the total heat liberated may be many times as great as can possibly be accounted for by the breakdown of *all* the available carbohydrate into lactic acid. Since, apart from carbohydrate, there is very little except the actual protein of the muscle which we can imagine to break down with such an evolution of heat, we are forced to conclude that the process of anaerobic activity

(or its products) has somehow induced the degradation of the muscle protoplasm itself to bodies containing less total energy.

Resting Heat-rate Drops with Recovery.

If, when the muscle has been fatigued in nitrogen, and its resting heat-rate is high, we admit oxygen, a recovery process sets in as usual, with a considerable evolution of heat. The lactic acid is removed and the muscle is restored to its previous resting condition. This occupies about an hour. If, now, we replaced the oxygen by a stream of pure nitrogen, within half an hour or so diffusion on the one hand, and the resting metabolism of the muscle on the other, have removed the last traces of oxygen from the interior of the muscle substance, and the resting heat-rate in nitrogen can again be measured. Instead of the high value found after stimulation we now observe a low value of the same order of size as before it. The breakdown processes produced by anaerobic activity have been cut short and the muscle has regained its previous steady state. The same treatment can then be applied once more. If the muscle be stimulated to fatigue, its resting heat-rate rises again; if oxygen be again admitted recovery ensues and finally a low value of the resting heat-rate appears as before. There seem to be two alternatives: either (1) the provision of energy by oxidation has restored to their normal state the membranes, interfaces, or agents, which in ordinary life hold apart the unstable reacting substances present in the living cell, which prevent—as I said in my paper—the organised system of the living cell from becoming a biochemical chaos; or (2) in the presence of oxygen some substances have been removed, perhaps by simple oxidation, perhaps by restoration to a precursor, as lactic acid is restored, which, if they be allowed to remain, assist as catalysts, or in some other capacity, in the anaerobic disintegration of the living material. One thing seems certain—the high heat-rate *is* a sign of some kind of irreversible breakdown or disintegration; if it be allowed to continue for a few hours no subsequent restoration of the muscle to its normal excitability is possible, either in oxygen or in oxygenated salt solution.

The phenomena in question are so curious, and the effects so relatively large and so easily demonstrated with the methods now available, that they demand an explanation. I have tested them by every means I could think of and they have withstood the attack. Were they due to a change in the hydrogen-ion concentration caused by the liberation of lactic acid? A resting muscle was immersed in pure CO_2 and its heat-rate remained practically unaltered; the Co_2 must have made it as acid as extreme fatigue. Were they due to a technical error of some kind? a reaction of some fatigue product with the metals of the thermopile? The thermopile was insulated with baked Elo (an artificial resin), shellac, and paraffin-wax; on top of these a piece of tin-foil; and over this a further layer of wax. The phenomenon appeared quantitatively as before. It is inconceivable that breakdown products of muscular activity can penetrate wax, tin-foil, wax, shellac, and Elo, one on top of the other. Was it due to injury in dissection? It was found unaltered in a frog's gastrocnemius, which can be prepared with an absolute minimum of injury. The temperature was lowered to 0° C. The high heat-rate existing in a fatigued muscle diminished to one-sixth, which is what we should expect if it were due to a chemical process occurring continuously, not at all what we should look for were a technical physical error the basis of the phenomenon. Many of my colleagues have witnessed the experiment, and they are agreed that in this respect, at any rate, I am not suffering from delusions. The phenomenon exists; it must be explained, not explained away.

Alternative Explanations.

I was inclined when I first described the phenomenon to the first of the two alternatives I mentioned, to the belief that oxygen restores the normal interfaces, or conditions which prevent the organised system from becoming a biochemical chaos. During the last few months, however, I have come across another effect which inclines me a little to the second alternative—perhaps both are correct. The experiment is a simple one and the result quite certain; it ought to have been made long ago; but one only thinks of these things slowly. If a muscle showing a very high resting heat-rate induced by anærobic stimulation be immersed for an hour or two in *oxygen-free* salt solution, its heat-rate returns to its original low level; the muscle need not even be alive; it may have been "electrocuted" by excessive stimulation, it may have been irreversibly damaged by too long a maintenance of its high heat-rate in nitrogen. Yet, under the influence of the washing, in a time which suggests diffusion outwards of some catalysing agent rather than an immediate effect of contact with a new environment, the breakdown evidenced by the previous high heat-rate is completely—or almost completely—stopped. Clearly, oxygen, as such, is not necessary for a reversal of the effect. Perhaps if lactic acid be not already present in excessive amount the lactic acid breakdown can take the place of oxidation in the maintenance of the normal internal architecture of the cell; perhaps, however, *something* is set free in the absence of oxygen, which induces —or helps to induce—the irreversible breakdown of the muscle protoplasm with a liberation of energy: a something which can be dialysed away by immersion of the muscle in salt water.

It is well known that in man too prolonged exposure to anoxæmia may produce harmful effects lasting for a long time or even permanently. As Haldane writes: "A short exposure, even with loss of consciousness, produces no serious after-symptoms; but occasionally a man's behaviour is very abnormal for a few minutes after recovery. . . . With severe and prolonged exposure to want of oxygen the nervous after-symptoms are of an extremely formidable nature and often end in death. . . . The symptoms are evidently due in the main to widespread injury to the nerve cells during the exposure. . . . The heart may also suffer in prolonged exposure to want of oxygen. The after-symptoms may be mainly cardiac; it may be a considerable time before the heart fully recovers. . . . Probably every other organ and tissue in the body feels the after-effects of severe exposure to want of oxygen. The patient often enough dies of pneumonia. Acute nephritis and gangrene of extremities have been noted." And so on. May we not be witnessing here in man the after-effects of the same partial disintegration of the living protoplasm as can so easily be demonstrated in anoxæmia in the isolated muscle?

Further Evidence of Harm from Oxygen Lack.

In another direction, this time in the strips of embryonic tissue studied by Warburg, we find evidence of a harmful effect of oxygen lack. An embryo of a chick is kept for some hours in salt solution saturated with nitrogen; oxygen is then introduced. In the normal embryo there is practically no lactic acid formation if sufficient oxygen be present; the free energy required for continued existence is maintained by oxidation. In the embryo, however, which has been subjected to a period of anoxæmia, the capacity for oxidation is diminished and a large part of the energy it requires must now be derived from the lactic acid breakdown. By anoxæmia, in fact, the normal embryo has been reduced to a state in which its metabolism is similar to that which Warburg has found to characterise tumour tissue. Can it be, as Warburg's work suggests, that oxygen lack working upon the normal architecture and machinery of the cell leaves behind a type of mechanism which leads in the end to the formation of tumour tissue? Dare we see in the disintegrative process produced by anaerobic activity in the isolated muscle cell an exaggerated case of the harmful effect produced in man by prolonged and severe anoxæmia, in the chicken embryo by oxygen want? It is dangerous to speculate too far, but it is foolish not to speculate at all.

I had hoped to be able to tell you the results of further experiments. If the increment in the resting heat-rate produced by anaerobic stimulation be really due to the presence of some diffusible chemical substance liberated in activity, then an extract of, or the dialysate from, a fatigued muscle might produce the same increment without stimulation. Experiments of this kind are being performed, but they have led, as yet, to no decisive result. It may, however, be possible by such means to explore the subject further. We may be able to decide whether in guarding the cell against disintegrative change the lactic-acid breakdown can, as in other respects, take the place of oxidation. To-day I can but indicate the complexity of the problem, the importance of the mechanisms here seen dimly at work, and the depths of our present ignorance of them.

NATIONAL BABY WEEK COUNCIL.

THE annual general meeting was held at Carnegie House on March 13th under the presidency of Sir Gomer Berry, chairman of the Council. He said that the chief aim of the Council's existence was the creation and establishment of a sound public opinion about maternity and child welfare, and this was achieved not only by general propaganda but also through intensive work by the members, who best knew the needs of their own areas. The Council had carried on its activities for 12 years, and was now linked up with some 70 national societies, but its regular income was totally inadequate for its needs. Sir Gomer then presented the challenge shields and other awards for local baby week campaigns in 1928, the Lady Astor shield for the great towns being won by Kettering, and the William Hardy shield for smaller areas by Hill and Cakemore.

Dr. Eric Pritchard, in presenting the annual report, said that the three points on which special attention had been concentrated in the 1928 campaign were: (1) immunisation

as a means of protecting young children against disease; (2) prevention of maternal mortality; (3) new developments in maternity and child welfare work. He spoke with appreciation of the help given by volunteers, by the press, and by certain commercial firms.—Dr. A. Stuart Hebblethwaite (M.O.H. for Sunderland) said he considered ignorance a prime factor in the suffering and ill-health among babies. Last year Sunderland's infant mortality-rate fell below 90 for the first time, but unfortunately the figure had been doubled in the first two months of this year, owing to measles, influenza, colds, and the great poverty prevailing.

Mr. Percy Gates, M.P., gave an address on the Development of the Child Welfare Movement and Block Grants. Since 1918, he said, the public health services had been working under a percentage system of grants, those grants being based on the expenditure of the local authority concerned. Under the Local Government Bill the Exchequer grants were to be paid to counties and county boroughs according to the needs of the locality estimated on a formula, and not according to expenditure. Though Mr. Gates had been responsible for introducing an amendment in the committee stage in the House of Commons to exclude maternity and child welfare services from the block grant provision—which amendment had not been adopted—he paid a tribute to the great consideration shown by the Minister of Health in his willingness to adopt certain safeguards, and admitted that he had made out a strong case for the alteration of the system. It was now for those interested in child welfare to use their influence in their own localities by serving on public bodies as well as on voluntary committees, to make the service as efficient as possible.

THE POSITION OF SUSSEX HOSPITALS.

THE last day of February brought to a close the annual meetings of the hospitals in Sussex whose year ends on Dec. 31st. Almost all of them say that their premises must be extended if they are to cope with the growing demand. At the same time they have to record a certain amount of indifference among the general public as gauged by the subscriptions.

On Feb. 28th Brigadier-General d'A. G. Brownlow said that as long as the *Royal Sussex County Hospital* had to go on gambling on free legacies the financial position could not be regarded as satisfactory. The governors were faced with a mountain of apathy. The report showed that the decrease in the number of patients admitted to the in-patient department and the increase in the average number of beds occupied and length of stay in hospital which was so noticeable in 1927 had continued in 1928. Some two-thirds of the in-patients underwent operations in the theatres, and the strain on the surgical and nursing staffs had been enormous. The theatres were no longer adequate for the work, and the 2181 operations had been performed in precisely the same space as was deemed sufficient for the performance of some 800 when the present suite was built 25 years ago. Mr. Bernhard Baron was going to give £5000 towards the provision of a new operating theatre, and the work would be put in hand as speedily as possible. There had also been a great increase, said General Brownlow, in the work of the pathological and bacteriological department, and the governors had reluctantly determined to close the school of massage, as it would be necessary to secure a considerable increase of accommodation to meet modern requirements and to secure an economical number of students, and this could not be found. The ordinary income had failed to meet ordinary expenditure by £5302, but owing to legacies a credit balance of £5580 was shown on the income and expenditure account. The result of the centenary appeal fund for £100,000 had been very disappointing, producing only £45,000, of which £10,000 was given by Mr. Bernhard Baron. The rise of rates was stated to have largely accounted for the average cost of each in-patient per week going up by 3*s*. 7*d*.

The *Royal Alexandra Hospital for Sick Children* in Dyke-road, Brighton, has now 100 beds, as compared with 74 in previous years. Its income in 1928 was insufficient to meet the expenditure by £744, and the annual report stated that at least another £1000 a year was required to meet the ordinary annual expenditure.—The *Sussex Eye Hospital* has appealed for £25,000 to bring the institution up to date. It is hoped to increase the number of beds from 30 to 50.—The *Sussex Maternity and Women's Hospital* is to be enlarged by the erection of a second new labour ward. The fact that no fewer than 143 patients attended the private wards last year is held to show that they fulfil a useful purpose. The institution's rates have not yet been paid for 1928, but the governors recorded their appreciation of the sympathy of the Finance Committee of the Brighton Corporation with regard to the assessment.

At the annual meeting of the *Brighton and Hove Dispensary* the chairman of the committee said hospitals were constantly being told to keep abreast of the times, and surely the best way to bring that about would be to relieve hospitals of the heavy burden of rates. Nearly 6500 out-patients were treated during 1928 and over 1600 visits were made to the homes of patients. At Hove Hospital the in-patients numbered 392 and the casualties 1635.—At the annual meeting of the *Sussex Throat and Ear Hospital* regret was expressed that the extension decided upon some years ago could still not be proceeded with. It was stated that the building fund, although it now amounted to £2650, did not justify beginning the work. The practice of the hospital is steadily increasing, but ordinary expenditure considerably exceeds ordinary income.—The *New Sussex Hospital for Women and Children* at Brighton, which is entirely staffed by women, has opened a new wing free from debt. The hospital is carrying out investigations in conjunction with three other hospitals on the treatment of cancer with radium. It is to be incorporated as a limited association, not for profit, and it is hoped to make the hospital a training school for nurses in the near future.

The *Queen Victoria Cottage Hospital at East Grinstead* records an improvement in the financial position as the result of an urgent appeal. The need of extension is said to be very pressing, but a scheme involving an expenditure of £8500 has had to be turned down, as the money is not forthcoming.—Extensions at *Worthing Hospital* since 1924 have cost nearly £41,000. The year's working shows a deficit of £656, and the fact that only £1150 came in by annual subscriptions is considered unsatisfactory in a town of the size and importance of Worthing.

ALLERGIC PHENOMENA IN RHEUMATISM.

IN an annotation last week entitled New Views on Rheumatism in Childhood attention was called to the possibility of rheumatism being in the nature of an allergic reaction. Dr. G. Arbour Stephens writes to recall an article in the *Medical Journal and Record* for Feb. 17th, 1926, wherein he described an anaphylactic condition, determined by the bites of insects, in relation to rheumatic fever.

THE WORK OF No. 3 CANADIAN GENERAL HOSPITAL.

THIS is just the book[1] that any one who served, or lost a relative who served, in No. 3 Canadian General Hospital would be glad to possess. It follows all the moves, retells all the events that in retrospect have come to mean so much, and reproduces many photographs of people and scenes that will bring a thrill. The book gives a good account of the history of the unit from its conception by its first commanding officer, Col. H. S. Birkett, in October, 1914, through its arrival in France on June 18th (Waterloo Day), 1915, to its return to Montreal on July 4th, 1919, after what Sir Arthur Sloggett, the Director-General in France, described as splendid service, during which it had dealt with 143,762 admissions. The first chief of the Medical Section was Lieut.-Colonel John McCrae, whose beautiful lines established the cult of the Flanders poppy, and who died of pneumonia just after his promotion to be Consulting Physician in the British Army. The hospital did most of its work at Boulogne, where it suffered much in air-raids, but pulled its weight in the heavy work of the force and materially helped in advancing the knowledge of medicine and surgery and the care of the wounded. We would have gladly seen more of the diary of Private McMutchkin (p. 21) who was wounded in the Salient, but as the doctor said it was in the Rolandic area, supposed he must have been moved there when unconscious! Several abstracts of valuable scientific papers are preserved in the book; the coolness of the nurses under fire and their self-denying care of their patients during air-raids is recorded, also the Christmas and other festivities, and our only regret is the want of an index of people and matters. Everyone distinguished seems to have wanted to see this hospital and to have been pleased with what he saw.

ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.

A PARAGRAPH on p. 568 of our last issue briefly reported the proceedings at the first annual meeting of the Royal Westminster Ophthalmic Hospital to be held at the new premises in Broad-street, W.C. By inadvertence the name of the hospital was confused with that of the Western Ophthalmic Hospital, whose in-patient department is now temporarily housed in the Hospital for Epilepsy and Paralysis, Maida Vale, whilst out-patients attend at 264, Edgware-road, W.

[1] No. 3 Canadian General Hospital (McGill). 1914–19. Edited and compiled by R. C. Featherstonhaugh. With a foreword from Field-Marshal H.R.H. The Duke of Connaught. The Gazette Printing Company, Montreal. 1928. Pp. 274. $5.

Goulstonian Lectures

ON

POLYURIA

Delivered before the Royal College of Physicians of London

BY ERNEST BASIL VERNEY, M.B. CAMB., F.R.C.P. LOND.,

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LECTURE II.*—EXPERIMENTAL REDUCTION OF RENAL TISSUE.

(Delivered on March 12th, 1929.)

MR. PRESIDENT AND FELLOWS.—In my last lecture I attempted to show that the polyurias associated with isolation of the kidney, with diabetes insipidus, and with water ingestion had an immediate ætiology which was common to all—namely, a decline in the content of the blood in the antidiuretic hormone normally secreted by the pituitary body. We saw that at the height of the diuresis the total molecular concentration of the urine was an extremely low one, and stress was laid on the rapid decline in the chloride concentration in the urine, a decline which proceeded to a degree such that it was scarcely possible to detect the presence of this substance in the urine. Moreover, the ebb of the chloride percentage synchronised with the flood of the water excretion. These facts demonstrated quite clearly that this type of polyuria was distinct both in its nature and ætiology from that elicited by a rise in blood pressure. In this latter case a rise in the rate of water excretion is invariably accompanied by a movement of the composition of the urine towards that of the plasma, and the specific gravity of the urine in like manner creeps not towards 1000, the value for distilled water, but towards 1009, the value for the protein-free filtrate of the plasma. I mention these facts again since it is in terms of what may be called a "pressure" diuresis that I believe the proximate explanation of the polyuria of chronic nephritis will ultimately be found.

It is, Sir, with considerable diffidence that I stand here to describe some experiments, performed recently by Miss Pickford and myself,[5] which I believe to have some bearing on the fundamental observations which you yourself made on the effects of reducing, by surgical means, the amount of kidney tissue in the dog, observations which you communicated to this College in your Goulstonian Lectures 31 years ago.[3] You showed [2] that the removal of amounts of renal substance up to two-thirds of the total was compatible with prolonged survival of the animal, and that even when the amount removed was as small as one-eighth to one-quarter "it was exceptional for the urine to return at all exactly to its original quantity and density, the most usual condition being one where the urinary water was distinctly increased in amount." Further, in the non-fatal cases in which the excision of a wedge from one kidney was followed one to six weeks later by the removal of the other kidney, the increase in the output of urine became more marked as the result of the second operation, and this increase was the one striking and constant phenomenon. The increase was observable within 24 hours of the operation and was not only considerable but also persistent, being present, for example, two years after the removal of the second kidney. Further, the urine became very pale and the specific gravity fell from the normal value, ranging between 1050 and 1030, to a figure varying between 1007 and 1020. No albumin nor sugar was present in the urine and the animals remained in good health. There was no increase in the amount of urea excreted but a slight increase in the percentage of urea in the blood was detected. Such animals, however, were unable to excrete a concentrated urine, and if very large amounts of nitrogenous food were given, the urea formed was readily excreted but only at the expense of a still further increase in the amount of urine. To quote from one of Rose Bradford's papers:—

> "The cause of the increased excretion of urinary water when the amount of available kidney is thus reduced is by no means clear; it is, however, not associated, as far as my observations have gone, with any very great increase in the general blood pressure." [3]

It is the feeling that the experiments which I propose to describe have some bearing on the mechanism of the production of this polyuria which constrains me to put before you some results which I believe are not entirely devoid of interest or importance in their pathological bearings.

The problem as to whether the whole of the blood passing through the kidney traverses of necessity the glomerular tufts was first attacked by William Bowman, who states the conclusion to which he arrived in the following words [1]:—

> "All the blood of the renal artery (with the exception of a small quantity distributed to the capsule, surrounding fat, and the coats of the larger vessels) enters the capillary tufts of the Malpighian bodies; thence it passes into the capillary plexus surrounding the uriniferous tubes, and it finally leaves the organ through the branches of the renal vein. . . . With the inconsiderable exceptions just mentioned, the terminal twigs of the artery correspond in number with the Malpighian bodies. . . . The blood leaving the Malpighian tufts is conveyed by their efferent vessels to the great renal reservoir, the capillary plexus surrounding the uriniferous tubes. . . . The vessels lie in the interstices of the tubes and everywhere anastomose freely so that throughout the whole organ they constitute one continuous network lying on the outside of the tubes, in contact with the basement membrane."

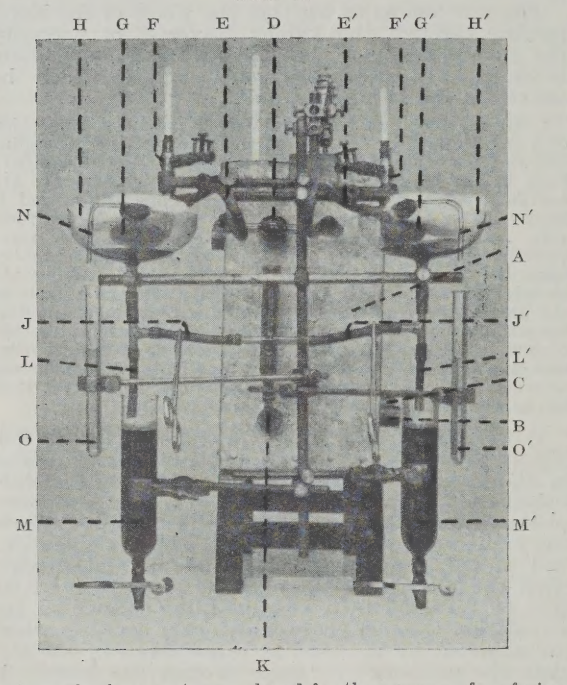
Bowman's original observations on the blood-supply to the kidney have been repeatedly confirmed in more recent years, and it may be taken as established that his conclusions form a correct statement of the facts. There is, then, no anastomosis between the branches of the renal artery. Their ramifications end in the glomerular tufts, and any interference with the blood flow through one of these branches will be reflected in a corresponding change in the circulation through those Malpighian capsules which are supplied by it. And in consequence of the fact that the network of vessels around the tubules is capillary in character, the capacity of one part of the network to feed any adjacent part is extremely limited. The occurrence and character of infarcts in the kidney bear adequate testimony to the rigidity of this restriction in that they demonstrate the dependence of a tubule for its blood-supply on the patency of its respective glomerular tuft, or at least on the transmission of blood through those glomeruli which preside over tubules in its immediate neighbourhood. Bowman clearly recognised and described the repetitive character of the architecture of the kidney and doubtless realised that the functional response of the kidney at any time was the integral of the responses of its individual units. The physiology and pathology of urinary secretion may therefore be approached from two closely related standpoints. On the one hand the reactions of the renal unit to changes in its environment may be studied and an attempt made to determine in what manner and to what extent these reactions are modified by the incursions of disease; on the other the nature and degree of the functional association, if such exists, between the structural units of the kidney may be made the primary object of study. On the one hand the reactions of the unit are deduced from a study of the effects of imposing a stimulus which is evenly distributed throughout the colony, on the other the stimulus is applied to certain members only of the community and the responses of the remaining members are determined. In the one case the individual, in the other the society forms the basis of study, and that there is some local means of

* Lecture I. appeared in THE LANCET of March 16th.

coördination within this society is, as we shall see later, extremely probable.

We have seen that the immediate cause of the polyuria in Rose Bradford's experiments was by no means clear. It was therefore of interest to determine whether the functional removal of portions of tissue from the kidney when perfused in the isolated state, and therefore entirely removed from any influence which might be exerted on it through the intermediation of the central nervous system or of the metabolic activities of other glands, would be followed by any change in the secretory activity of the remainder. The simplest way in which this could be accomplished was clearly by the ligature of one of the branches of the renal artery since, as we have seen, by so doing the region supplied by this branch

FIG. 1.



Photograph of apparatus employed for the purpose of perfusing two kidneys in parallel. (For description see text.)

should become completely anoxæmic and, in consequence, cease to function. It was therefore decided that a primary branch of the renal artery should be ligatured during the perfusion of the kidney in the isolated state and the effects on the rate of flow and composition of the urine determined. Some preliminary experiments showed that such a procedure was unaccompanied by so great a fall in urine flow as would be expected on purely anatomical grounds; indeed, on some occasions the rate of urine elimination actually increased as the result of arresting the circulation through approximately 50 per cent. of the total kidney substance. But the interpretation of such experiments was difficult, in that it was found impossible to assess at all accurately the changes in rate of flow and composition of the urine from the values which these would have exhibited had there been no interference with the blood-supply to a part of the kidney. One could compare the sample of urine collected immediately before the branch was ligatured with that immediately following, but such would not yield a truly quantitative index of the effects of applying the ligature, since the physiological state of the kidney itself was slowly undergoing changes during the whole course of the experiment. This is a difficulty inherent in all those experiments of a biological nature in which an attempt is made to interpret quantitatively the effects of producing an irreversible change of state. The difficulty may be overcome in one of two ways. Either the experiments are performed on a large scale and the results subjected to statistical treatment, or the experiment is rigidly controlled by the *simultaneous* conduction of another, the two experiments being carried out under conditions as nearly identical as it is possible to devise and maintain. Fortunately, the kidney is a bilateral organ, and it was decided to explore the possibility of perfusing the two kidneys of one dog with the heart-lung preparation, in the hope that the two kidneys so perfused would secrete urines at approximately the same rate and of approximately the same composition. This was found experimentally to be the case. The apparatus which has been employed is shown in Fig. 1.

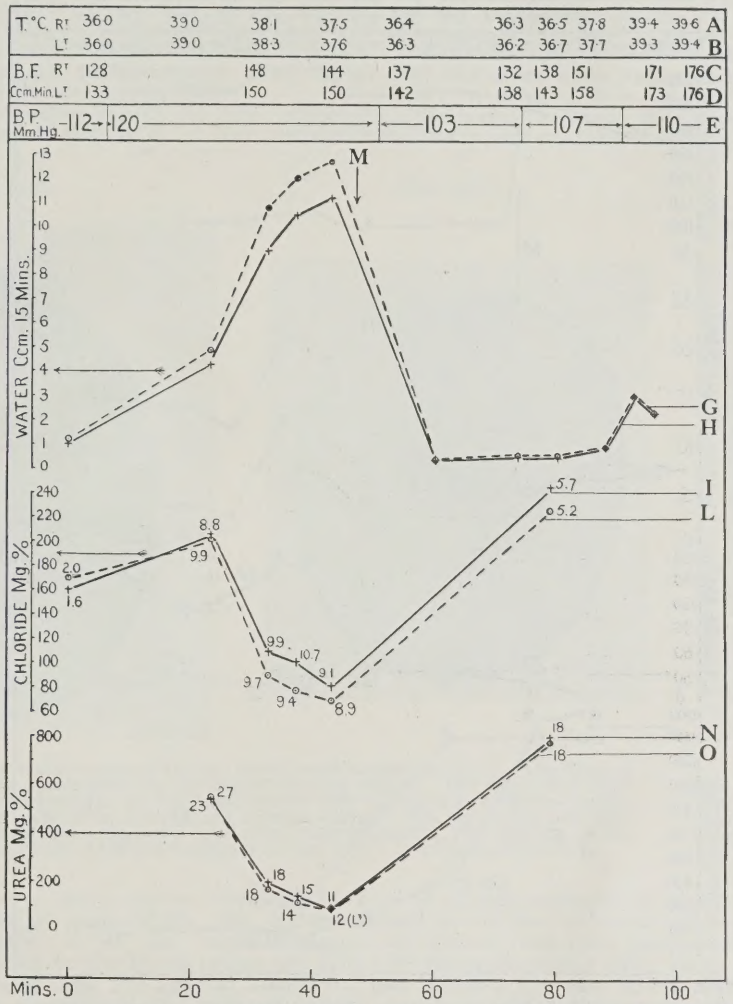
The venous reservoir, peripheral resistance, and the warming coil through which the arterialised blood passes to the kidneys are placed inside the water thermostat A. This is maintained at constant temperature by an electrical hot point, and by such means variations in the temperature of the circulating blood are almost entirely eliminated. The blood from the venous reservoir leaves the tank A through the tubulure B. Thence it passes to the cannula in the superior vena cava of the dog, which lies to the right of the apparatus. The brachiocephalic cannula is connected through the tubulure C with the variable peripheral resistance within the thermostat, and the blood having traversed the resistance, returns to the venous reservoir. From the high-pressure side of the resistance blood passes through a warming coil and leaves the tank through the tubulure D, whence it is distributed via the tubes EE′ and cannulæ FF′ to the renal arteries of the two kidneys GG′ resting in the glass vessels HH′. The venous blood from the kidneys runs back to the venous reservoir via the tubes JJ′ and K. The blood flow through the kidneys can be determined at any time by moving the Spencer-Wells forceps from LL′ to the position shown in the figure. The blood then passes into the graduated vessels MM′ and the time required for the delivery of 50 c.cm. is measured. The cannulæ NN′ are tied into the ureters and the urine is collected in the graduated tubes OO′.

The two kidneys from a dog are thus being perfused under identical conditions, and it is found under favourable circumstances that the rates of blood flow through the kidneys, the rates of urine elimination and the compositions of the urines are approximately the same on the two sides. Fig. 2 demonstrates the truth of this statement. During the early part of the experiment the blood pressure was maintained constant and the gradual rise in the water-output and fall both in chloride and urea percentages are well seen. Further, it will be observed that the graphs representing these urinary changes on the right and left sides follow one another faithfully. At the point M a sudden and severe change in the conditions of perfusion of the two kidneys was made by the addition of a large volume of freshly defibrinated blood to the circulation, combined with a lowering of the arterial blood pressure. The responses of the two kidneys to the infliction of so intense a change in their environment are practically identical and run parallel the one to the other until the conclusion of the experiment, which lasted more than two hours. Further, the rates of blood flow through the two kidneys showed a close approximation and reacted to the above changes to a degree which was almost identical on the two sides. Other control experiments demonstrated the quantitative similarity in the responses of two kidneys to such stimuli as were produced through the addition of urea, sodium sulphate, or pituitrin to the circulating blood. My object in stressing these experiments is to show that in such a preparation as has just been described we are provided with two isolated kidneys which may be considered to be strictly in the same physiological state, in that both the past history and present condition of the one correspond accurately to those of the other. If, then, a change of state, even an irreversible one, is produced locally in the one kidney, the effects of this change may be quantitatively determined simply by reference to the conduct of the other kidney, which is functioning throughout as a simultaneous control. It is with this, the heart-lung-double-kidney preparation, that Miss Pickford

and I [5] have begun an investigation into the effects on the function of one part of the kidney of arresting the circulation through the remainder.

The renal artery of the dog divides into two main branches of approximately equal size near the hilum of the kidney, one branch supplying the anterior half, the other the posterior half of the organ. When one or other of these branches is ligated there is, as would be expected, a marked fall in blood flow through the kidney, a fall, moreover, which, as we shall see later, corresponds accurately to the diminution in the amount of functioning tissue. The urine flow, however, shows no comparable diminution, indeed quite commonly an absolute increase in its rate is encountered, an increase, moreover, which is immediate in its onset. It seemed that we were here dealing with a very remarkable phenomenon, a phenomenon which was not embraced by current theories on the mechanism of the secretion of the urine, and therefore demanded a closer study. It will, I think, make the conclusions which we are inclined to draw from this study, in so far as it has been carried up to the present time, more intelligible if a description of an actual experiment is given, and the results of this experiment depicted in a concrete form. The results of such have been collected in Fig. 3. The rates of blood flow through the two kidneys, the rates of urine flow, and the percentages of chloride and of urea in the urine from each kidney are charted in order from above downwards. In the initial part of the experiment, as far as the point M, it is seen that the two kidneys are secreting urines which are practically identical both as regards their rates of flow and as regards their content in chloride and in urea. Moreover, the blood flow through the right kidney is, within the limits of accuracy of the measurement, the same as that through the left. At the point M a ligature which had earlier been placed loosely around the anterior primary branch of the right renal artery was securely tied. The blood flow falls precipitously to a new value which is in point of fact 51 per cent. of the rate it exhibited immediately before the tying of the ligature. Approximately 50 per cent. of the right kidney was therefore suddenly excluded from the circulation. But this extreme interference had no detectable influence on the rate of urine elimination. The urine continued to flow for a time at the same rate as that secreted by the left kidney, and then gradually climbed away from the control rate as is shown by the divergence of the continuous from the interrupted line of water excretion. On arresting the circulation through half of the right kidney, therefore, the remaining half suddenly, and without a moment's hesitation, doubled its previous rate of secretion. The degree of the polyuria on the right side showed a progressive increase throughout, and immediately before the close of the experiment the rate of secretion of the half of the right kidney was 30 times as great as that of the whole of the left kidney. The thin continuous line H in the figure shows the rates at which the half of the right kidney would have secreted had arrest of the circulation through the remainder been without influence upon it. The values so plotted are 51 per cent. of the control rate of urine flow on the left side, since there was a 49 per cent. reduction in blood flow on the right side as the result of ligaturing the arterial branch. In some experiments the rate of urine flow fell as the result of interrupting the circulation through part of the kidney, but this fall never approached the calculated rate. In other words, arrest of the blood-supply to one part of the kidney invariably produced a relative increase in the flow of urine, and not infrequently an absolute increase, from the other part. Passing now to the chloride figures, it will be seen that no appreciable change was produced in the percentage of chloride in the urine by ligaturing the arterial branch. The amounts of chloride excreted per unit interval of

FIG. 2.



Heart-lung double-kidney preparation. No urea added to the circulating blood. Left kidney excised before right. Post mortem the kidneys appeared normal. The right kidney weighed 28 g.; the left 29 g.

A and B, Temperature in °C. of blood in right and left arterial cannula respectively. C and D, Blood flow through right and left kidney respectively in c.cm. per minute. E, Mean arterial blood pressure in mm. Hg. G and H, Urine flow, left and right kidney respectively in c.cm. per 15 minutes. I and L, Chloride (as NaCl) in right and left urine respectively in mg. per 100 c.cm. N and O, Urea in right and left urine respectively in mg. per 100 c.cm. M, 300 c.cm. fresh defibrinated blood added.

The figures on the chloride and urea graphs represent the amounts (in mg.) secreted per 15 minutes. The time of a plotted point is the mean time of the interval during which the sample of urine was collected.

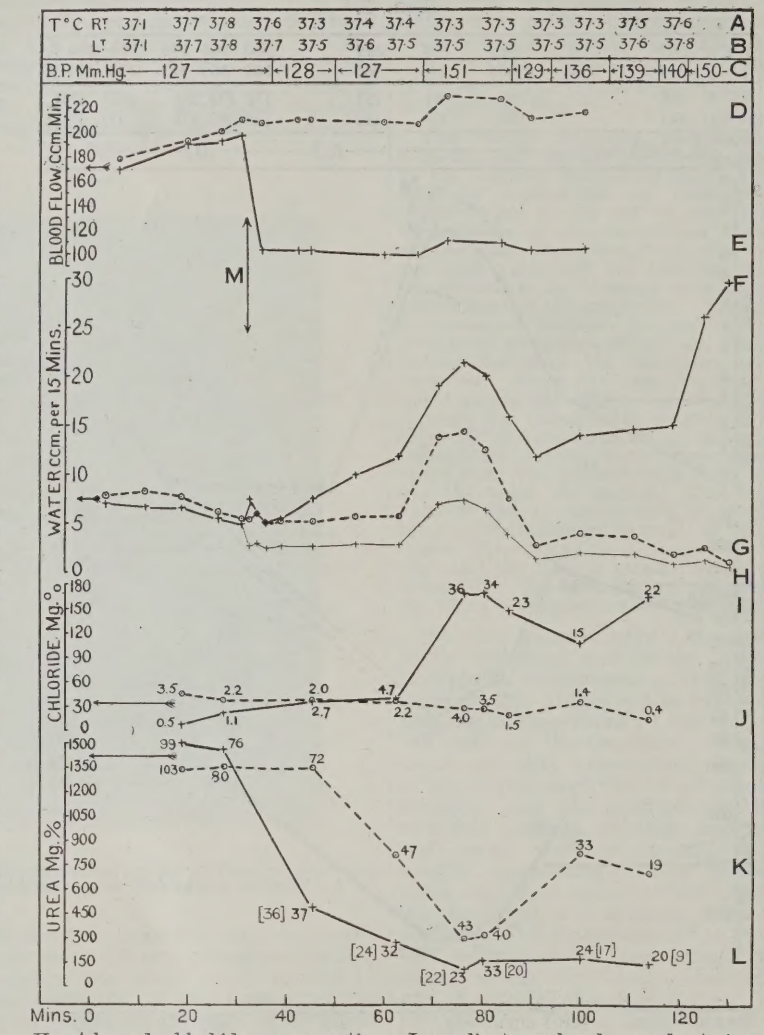
time increased, however, on account of the polyuria which we have just been considering. It will be observed that in this experiment the chlorides are extremely low percentually, and it is an experimental fact that when such is the case the effect of an increase in perfusion pressure in causing the typical approach towards the chloride concentration of the plasma, is small or even entirely absent. In other experiments of this type there has been an increase more or less definite in the percentage of chloride eliminated. The minute output, however, always shows a relative increase, sometimes even, as in this particular experiment, an absolute increase. Further, it will be seen that the reduced kidney gave a much more marked response to a rise in perfusion pressure in so far as concerned its rate of chloride secretion, an important fact to which we shall have occasion later to return. The effects, then, on the chloride excretion of a functional reduction of such a degree in the renal tissue may be summed up by saying that there is invariably a relative increase and quite commonly an absolute increase in the minute output. At high blood pressures this absolute increase becomes, as far as our observations have gone, invariable.

A very different state of affairs, however, is encountered when we come to consider the output of urea in such an experiment. The figure shows quite clearly that ligature of the arterial branch is followed immediately by a profound fall in both the percentage and absolute amounts of urea eliminated. But if we calculate the absolute amount which should have been eliminated by the reduced kidney on the assumption that the perfused part is secreting at the same relative rate as the control kidney, the theoretical figures so obtained are a little lower than those actually found by experiment. (Compare the figures showing the absolute amounts of urea excreted with the bracketed figures adjacent to them.) The excretion of phenol red or of indigo carmine shows a reaction to the functional reduction in the renal tissue comparable to that of urea.

Towards the end of the experiment charted in Fig. 3, 100 mg. of indigo carmine were added to the circulating blood, and the post-mortem appearances of the transversely bisected kidneys are reproduced in Fig. 4. None of the dye was seen in the infarcted region of the right kidney with the exception that traces were visible as short and narrow streaks at the points A and B. The sharp line of demarcation between the perfused and infarcted zone is well seen, and particular stress may be laid on the difference in intensity of the blue colour in the two kidneys, the surface of the reduced kidney exhibiting a paler or, as one of my technical assistants appropriately expressed it, "a more washed-out appearance" than that of the control kidney.

Before discussing the significance of these changes in composition of the urine, it is essential that we should determine whether the polyuria which is observed arises, as has so far been assumed, as the lone result of a functional change in the perfused part, or is due to the secretion of a dilute solution of chloride by the infarcted region which may still receive a small blood-supply via the capsule, or through the intertubular capillary anastomosis, or through both. It is of interest that Hermann [4] in 1862 observed in 3 out of 18 experiments an absolute increase in the urine flow following ligature of the renal artery in dogs. He states: "Unter 18 Versuchen zeigte sich dreimal die auffallende Erscheinung, dass nach Schliessung der Ligatur der Harn ununterbrochen und sogar mit grösserer Geschwindigkeit als früher, abgesondert wurde." The increase was attributed by him to an exceptionally generous supply of blood to the kidneys through collateral channels, since in all the other experiments the urine flow

FIG. 3.



Heart-lung double-kidney preparation. Loose ligature placed around anterior branch of right renal artery.

A and B, Temperature in ° C. of blood in right and left arterial cannula respectively. C, Mean arterial blood pressure in mm. Hg. D and E, Blood flow through right and left kidney respectively in c.cm. per minute. F and G, Urine flow from right and left kidney respectively in c.cm. per 15 minutes. H, Theoretical rate of urine flow from right kidney in c.cm. per 15 minutes (see text). I and J, Chloride (as NaCl) in right and left urine respectively in mg. per 100 c.cm. K and L, Urea in right and left urine respectively in g. per 100 c.cm. M, Anterior primary branch of right renal artery was ligatured at this point. The figures on the chloride and urea graphs represent the amounts (in mg.) secreted per 15 minute interval of time. The figures in brackets are the theoretical amounts of urea secreted by the right kidney calculated on the basis of the measured diminution in blood flow (see text). (L. M. Pickford and E. B. Verney.)

stopped when the blood-supply to the whole kidney was arrested. It seems not improbable that in the case of these three experiments of Hermann, ligature of the main arterial supply evoked an increased functional response by small portions of the kidney which were receiving a supply of blood, adequate to their needs, from those few and scattered interlobular vessels which perforate the capsule and inosculate with vessels in the perirenal fat. Unfortunately in his paper he gives no analysis of the urine before and after ligature of the renal artery, so that it is impossible to interpret with confidence these few results of his in terms of those which we are now discussing, although an interpretation along these lines would seem to be not unreasonable.

But that the capsular supply to the infarcted region of the isolated kidney is in no way connected with the production of the polyuria which we have observed is completely proven by the following observations. Firstly, in all the experiments in which a dye was added to the blood before the close of the experiment and after the arterial branch had been ligatured, the pigment in the reduced kidney was limited to the perfused region, the line of demarcation being extremely well defined. Moreover, the intensity of the pigment was much less in the reduced kidney than in the control, corresponding with the lower concentration of dye in the urine from the former than in that from the latter. This last observation in so far as the difference in tint of the cortex of the two kidneys is concerned is not alone conclusive evidence, since the capacity of the tubular epithelium to concentrate the dye within it might be affected in the reduced kidney without there being of necessity an accompanying increase in the rate of urine elimination. (See Fig. 4.) Secondly, the responses already described as resulting from ligature of a branch of the renal artery are not affected by stripping the capsule from the infarcted region and thereby eliminating entirely any supply of blood through this agency.

There still remains the possibility of there being a slow flow of blood from the perfused to the infarcted region through the extensive intertubular capillary plexus, and of the cells in this latter region secreting, in consequence of so abnormal a circulation, a dilute solution of chloride along with a trace of urea. Such an explanation of the facts is disproven completely by the observation that if a dye such as phenol red be added to the blood before the arterial branch is ligatured, the medulla of the infarcted region as seen at the end of the experiment is darker in tint, not only than the neighbouring part of the medulla, but also than the medulla of the control kidney.

It may be taken as established, therefore, that after a primary branch of the renal artery has been ligatured under the conditions of these experiments, the urine secreted originates solely in the part of the kidney, the blood-supply to which has not been interfered with. The infarcted region takes no share in its production. But the urine is, as we have seen, markedly changed both in rate of flow and in composition, and in attempting to arrive at a more detailed knowledge of the means whereby this increase in flow is achieved, it is clearly essential to know whether the pressure and rate of flow of blood in the one part of the kidney are altered from their previous values by arresting the blood-supply of the other part. In those experiments in which a dye was added after the arterial branch had been ligatured it was quite easy at the end of the experiment to dissect off the cortex of the kidney and to weigh the stained and unstained portions. The percentage reduction in the renal cortex could in this way be compared with the percentage reduction in blood flow consequential to ligature of the arterial branch. The two percentages were found to be almost identical. No appreciable change in blood flow through the one part of the kidney, therefore, occurred as the result of arresting the circulation in the other part. Further, the ligation of the vessel led to a small rise, 1 to 2 mm. Hg, in the general arterial pressure, which was, of course, transmitted to the control kidney and could be immediately neutralised if desired by adjusting the artificial peripheral resistance of the preparation. But, more important, a saline differential manometer connected to the perfusion cannulæ near their insertion into the renal arteries showed no appreciable pressure difference when the branch of the one renal artery was ligated. There was, it is true, a slight rise on the ligatured size owing to the retardation in the blood flow through the cannulæ, but the change was only 3 or 4 mm. of saline, of entirely the wrong order of magnitude to effect such gross changes of urine flow

FIG. 4 (*a*).

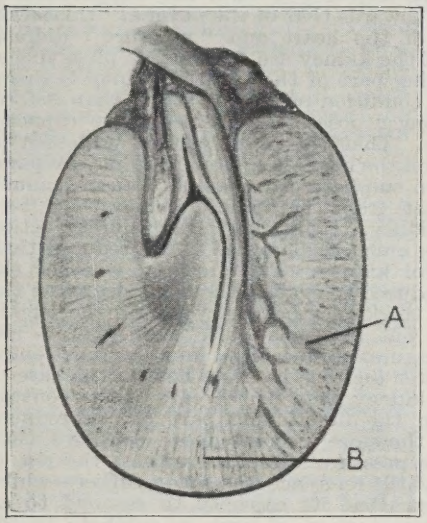
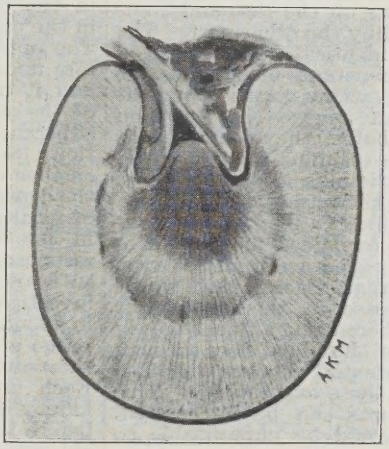
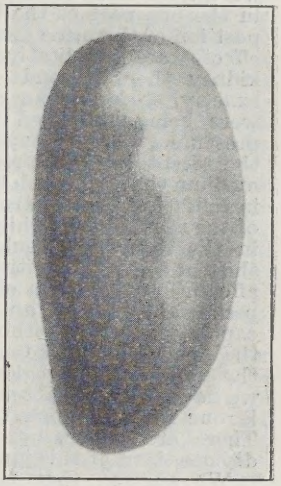


FIG. 4 (*b*).



The appearance of the sectioned kidneys of the experiment charted in Fig. 3. The kidneys were cut transversely immediately at the end of the experiment. Fig. 4 (*a*): The right side shows the infarcted region, no dye being visible here excepting two narrow streaks at A and B. The left side of the figure is the polyuric region. This region was pale blue in colour in the original specimen. Fig. 4 (*b*): The control kidney. The blue colour was uniformly darker than that of the left-hand side of Fig. 4 (*a*). (Pickford and Verney.)

FIG. 5.



The external appearance of an infarcted kidney from an experiment similar to the one charted in Fig. 3. (Pickford and Verney.)

from the reduced kidney as we have already observed to occur.

The vascular condition in the one part of the kidney, therefore, in so far as the arterial pressure, blood flow, and total resistance are concerned, remain unaffected when the blood-supply to the other part is arrested.

I do not propose to discuss at this juncture the mechanism by which the one part of the kidney becomes cognisant of the infarction of the other and immediately responds by secreting urine at a faster rate. But that there is some means other than through their blood-supply by which the functions of the secretory units of the kidney are continuously integrated seems an unavoidable deduction from the facts which have been presented. We are able, however, to form a clear idea of the nature of the stimulus which the one part of the kidney receives from the neighbouring infarcted region. We saw in the last lecture the effects on the rate and composition of the urine of an increase in the pressure at which blood was supplied to the kidney. To-day we have observed the effects of circulatory arrest in the one part of the kidney on the rate and composition of the urine secreted by the other part. The effects are qualitatively identical. The reduced kidney then responds at constant blood pressure exactly, so far as our observations go, as though it were being subjected to an increase in perfusion pressure. If, as seems probable, the glomerulus is the receptor of the pressure stimulus and the intermedium through which this stimulus becomes effective in initiating, and controlling the rate of, the secretion of the renal unit of which it forms a part, the increase in the urine flow could be explained in terms of a shift of a given quantity of resistance from the vasa afferentia to the vasa efferentia. Such a shift would presumably entail an increase in the glomerular capillary pressure without there being any changes in the general blood pressure or the blood flow through the non-infarcted region, potential changes which, as we have seen, are absent in these experiments. This is one way in which the facts can be interpreted. There are others, but it would be unprofitable to discuss them at this juncture.

We suggest that the polyuria which we have observed from the isolated kidney as the result of arresting the blood-supply to a part of it, is of similar ætiology to the polyuria observed by Rose Bradford in his survival experiments on the surgical removal of portions of kidney tissue from the dog. The nature of these experiments necessarily precluded any conclusions being drawn as to whether the responses of the reduced kidney were initiated locally, reflexly, or through the intermediation of some chemical substance locally or remotely produced. The rapidity of the responses of the kidneys both in Rose Bradford's experiments and in our own, in the one case observable within 24 hours, in the other case immediate, and the qualitative similarity in the changes in composition of the urine in the two cases, suggest that there is behind the production of both some common underlying cause. If this be so it is difficult to resist the belief that in such experiments a coördination of a mutually *inhibitory* nature exists between the various parts of the mammalian kidney, perhaps between even the individual units of which it is composed. An hypothesis involving coördination through the intermediation of the nervous tissues in the kidney would seem to fit most easily the experimental facts in so far as they have been obtained up to the present. But such an assumption is extremely speculative, and whatever the mechanism by which this local adaptation is brought into being, its results are perfectly definite, and may be summed up by saying that the pressure stimulus to secretion has become more effective. If one part of the kidney is functionally removed from the field of activity, the remaining part develops intrinsically just that stimulus which previous knowledge tells us is the most effective in producing an increased flow of urine.

It will have already been noticed that there is a marked relative increase in chloride, not infrequently indeed an absolute increase, following a reduction in the functioning renal tissue. The increase in the output of urea, however, relative to the concomitant tissue reduction is small and, as we have seen, the absolute output is invariably and markedly diminished as compared with the output of the control kidney. Such a preparation then is exhibiting a condition of urea retention with little or no retention of chloride. The specific gravity and composition of the urine from the functioning part are approaching those of the protein-free filtrate of the plasma. The part of the kidney which is secreting more urine is undoubtedly performing more work than before—calculation shows that this is so in the case of the isolated kidney—and it shows signs of failure in so doing. For just as the heart, both when it is called upon to perform more mechanical work, and while its tone is diminishing under a constant load, responds by dilating, so the kidney responds to an increase in the intensity of the applied stimulus or to a decrease in its tone by secreting a fluid, the composition of which moves towards that of the plasma. Dilatation in the case of the heart and "pressure" diuresis in the case of the kidney are comparable phenomena. The functioning part of the reduced kidney is therefore under a condition of greater strain than before, and it no longer possesses the responsive capacity of the whole. That this is so can be well seen in experiments on the heart-lung-double-kidney preparation. Sodium sulphate, for example, causes a much smaller diuresis from the reduced kidney than from the control kidney. Similarly, the antidiuretic action of pituitrin is much less marked in the reduced than in the control kidney. The question whether the response is reduced to exactly the same degree as the substance of the kidney has not yet been thoroughly investigated, but it seems quite clear that a rise in blood pressure produces per unit of functioning tissue a greater increase in urine flow in the case of the reduced kidney than in the case of the control. Each unit in the functioning part of the reduced kidney has therefore become more sensitive than before to the pressure stimulus—witness the rise in chloride to which reference was made earlier—whilst it is not clear that its capacity to respond to an increased concentration of urea or sulphate in the blood is in any way altered. Whether the increased response of a unit in the reduced kidney is occasioned by a shift in resistance from the vas afferens of the glomerulus to the vas efferens, a hypothesis which was put forward earlier in this lecture to account for the absence of any change in blood flow through the one part of the kidney when the blood-supply to the other part was arrested, we do not know. Such a hypothesis would necessarily carry with it an increase in the glomerular capillary pressure, and an increase in the rate of filtration through the glomerulus, if such indeed be one of its functions. But I should like here to emphasise the fact that filtration through the glomerular capillaries in mammals has not been proved to occur, and it would seem in the present state of knowledge to be unwise to close one's eyes to the possibility of some mechanism other than that of filtration affording the means of communication between the pressure stimulus and the effector cells of the tubules. We here confine our attention to the responses of the secretory unit as a whole, and do not attempt to differentiate these responses into functions of its individual parts.

I propose now, if I may, to summarise in as brief a form as possible the main points to which attention has been directed in this lecture, and the conclusions which may legitimately be drawn therefrom.

Functional removal of a part of the renal tissue leads, as Rose Bradford has shown, to a polyuric response by the remaining part. Since a similar phenomenon is encountered in the case of the isolated kidney, it is probable that the mechanism involved in its production is the same in both cases, and that the results of a study of the response in the isolated organ may justifiably be transferred to the interpretation of the response obtained by Rose

Bradford in the whole animal. In the isolated kidney the mechanism culminating in this response is a strictly local one and is not entirely of a chemical nature. The response itself is immediate. The changes in the composition of the urine show that the stimulus to the functioning parts of the reduced renal tissues is similar in nature to that produced by a rise in blood pressure. There is developed, then, locally, just that stimulus which we know to be the most effective in increasing the flow of urine. This increase in the stimulus entails the expenditure of more energy by the renal units concerned, and the increased work which they are called upon to do is accompanied by their partial failure. This failure is manifested in an approach in the composition of the urine towards that of the protein-free plasma, the "urine" of complete renal failure, with the consequential difficulty in the excretion of adequate amounts of urea and relative ease in the elimination of chloride. Lastly, we have seen that the responsiveness of the reduced kidney to the addition of such substances as sodium sulphate or pituitrin to the blood is impaired to a very marked degree.

With the bearing of these facts on the pathology of chronic nephritis and the means whereby the kidney, gradually deprived of its reserves, strives to maintain to the end its primary function of maintaining the constancy of composition of the "milieu interne," it is proposed to deal in the next lecture.

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POST-OPERATIVE GASTRIC ACIDITY.

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MANY and varied are the theories advanced to explain the ætiology of progressive peptic ulceration of the stomach and duodenum. Devitalisation of the mucosa by infection and the presence of hydrochloric acid and pepsin have each been apportioned their respective rôles in the production of localised proteolysis resulting in ulceration. Workers in this field of research have added in support of their views a wealth of experiments; nevertheless, the true pathogenesis of gastro-duodenal ulceration remains undiscovered. Still more conflicting are the views advanced to explain the healing of peptic ulcers. The neutralisation of the gastric acid by alkalies and its absence or neutralisation following the operation of gastro-jejunostomy have each been cited as the modus operandi of cure, in the former instance by medical means and in the latter by surgical. Bolton [1] emphasised the part played by gastric acidity in healing the ulcer. Paterson [2] stated that after gastro-jejunostomy there was diminution of the total chlorides with an almost constant increase in the mineral chlorides of the gastric contents, an important factor in reducing gastric acidity and thus promoting healing of the ulcer. Bolton and Goodhart [3] maintained that the absence of free hydrochloric acid or the presence of a low active hydrochloric acid curve are no indications, when taken alone, that the gastric secretion is correspondingly diminished, for the total chlorides may still be at the normal height, the readings being the result of free duodenal regurgitation and similar to those of successful gastro-enterostomy cases. It is generally assumed that gastro-jejunostomy causes a marked diminution in the gastric acidity value. In fact, the curative effect of this operative procedure on gastric and duodenal ulcers is usually ascribed to the reduction of gastric acidity after the operation.

From the study of post-operative cases attending the "follow-through department" it was thought that the achlorhydria which existed in many instances immediately after the operation of gastro-jejunostomy for the cure of a duodenal ulcer did not persist, and that the conception of the cure of gastric or duodenal ulceration as solely or primarily a question of removing or neutralising the acid was erroneous. A series of cases was therefore investigated, and the results are embodied in this paper.

Material and Technique.

A study was made of 60 cases, 49 of whom are males and 11 females. In all instances the operation of gastro-jejunostomy had been performed for the cure of a chronic duodenal ulcer. The gastric acidity was estimated after the Ewald test-meal. Estimation by the fractional method was impracticable, as most of the patients were unwilling to submit to an investigation which would detain them for three hours or more. Only those subjected to the Ewald type of test-meal before and after operation were therefore called up for the third or late post-operative test-meal. Out of 149 cases invited to attend for this further test of the gastric acidity only 60 responded; of the remainder 15 had left the neighbourhood and could not be traced, 3 had died of intercurrent diseases, 1 was reported to have died at another hospital following an operation for perforation of a chronic gastric ulcer; many assured us of their fitness since the operation and considered any further investigation of their cases unnecessary; others did not reply. The present investigation, however, is not intended to be a statistical study of the results of gastro-jejunostomy, as the observations are confined to the functions of the stomach after gastro-jejunostomy with special reference to gastric acidity.

It was at one time thought that X ray examination of the stomach after the opaque meal would be a valuable adjunct to the study of its functions, but the results obtained by other workers have been disappointing. Smithies,[4] investigating a number of cases by this means, concluded that, apart from demonstrating the patency or closure of the pylorus or gastro-jejunostomy stoma and the recognition of some of the complications following the operation, little reliable information about gastric function could be obtained.

In the following series of cases the acidity values are expressed in terms of free HCl and total acidity, the free HCl being estimated as grammes per 100 c.cm. and the total acidity determined in terms of c.cm. N/10 HCl.

The interval between the pre-operative test-meal and the operation varied usually from one to seven days. The early post-operative test-meal was taken about 14 days after the operation and immediately before the patient's discharge from hospital. The late post-operative test-meal was carried out after a period of six months to eight years after the operation; in 53 cases the interval was two years or longer, whilst in 26 instances four years had elapsed since the early post-operative test-meal.

In 59 cases posterior gastro-jejunostomy and in one case an anterior retro-colic gastro-jejunostomy had been performed. Occlusion of the pylorus was not practised in any of the cases. Cholecystectomy had been carried out in two cases, and in 30 the appendix had also been removed. Appendicectomy did not appear to affect the post-operative gastric acidity in any way. All the operations were carried out either by Mr. James Sherren or by one of us (E. C. L.). It is found convenient to arrange the cases in four groups depending on the relationship between the acid values found in the early and late post-operative test-meals. In the first group are included cases where free hydrochloric acid was absent in the early but present in the late post-operative test-meal. In Group 2 are placed the cases where free hydrochloric acid was found at both post-operative test-meals. Cases

showing achlorhydria immediately after operation and also on re-examination are included in Group 3, whilst those having free acid in the early but no free acid at the late post-operative test-meal are listed in Group 4.

GROUP 1. *Free Hydrochloric Acid Absent in the Early but Present in the Late Post-operative Test-meal.*

Fifteen cases—i.e., 25 per cent.—fall into this group; 12 are males and three females. Their ages range from 35 to 68 years, the average being 48. There was an interval of two years in all cases—and over four years in nine cases—between the early and late post-operative test-meals. The lowest acidity value was 0·07 per cent. free hydrochloric acid; in ten patients it was 0·1 per cent. or over, and in six it was 0·15 per cent. or greater. In one it had increased to 0·22 per cent., the interval between the test-meals in this case being three years; the pre-operative acid value had been 0·17 per cent. Thirteen patients were free from symptoms and in perfect health, one had vague symptoms, and the other, who complained of much abdominal discomfort and vomiting, had a strong alcoholic history, the acidity values in these two cases being 0·11 per cent. and 0·18 per cent. free acid respectively.

From a study of this group it will be seen that the condition of achlorhydria found immediately after operation may not, and does not, persist in the majority of cases, and that the persistence of achlorhydria is not a necessary factor in the complete alleviation of the patient's symptoms after gastro-jejunostomy. It further shows that the gastric acidity may have a higher value at the late post-operative test-meal, although the operation has relieved the patient completely of all symptoms.

GROUP 2. *Free Hydrochloric Acid Present in Both Post-operative Test-meals.*

Twenty-five cases fall within this group—23 males and two females. The ages vary from 26 to 64 years; the average age is 42. The interval between the early and late post-operative test-meals was two years or more in 22 cases, and over four years in eight. The lowest acidity value recorded in this group is 0·06 per cent. free hydrochloric acid; 21 had a free acid value of 0·1 per cent. or over; in 11 it was 0·15 per cent. or greater, whilst in four the free value varied from 0·2 per cent. to 0·24 per cent. The acidity value in the late post-operative test-meal remained the same as that in the early post-operative test-meal in two cases, was higher in 15 and lower in 8. Twenty-one patients in this group are free of symptoms. Of the remaining four one has symptoms pointing to the presence of an anastomotic ulcer; in this instance the free acid value is 0·18 per cent., and the total acidity 62; but the patient will not consent to further surgical measures. Three have indefinite dyspeptic symptoms; one of these, a heavy smoker, finds that he is free from all symptoms when he abstains from smoking; another has a strong alcoholic history.

A study of this group again emphasises the unreliability of the early post-operative test-meal as an indication of the true post-operative gastric acidity, the acid value as shown in the late post-operative meal being considerably higher in 15 cases.

GROUP 3. *Free Hydrochloric Acid Absent in both Early and Late Post-operative Test-meals.*

Eleven cases are placed in this group—seven males and four females. The ages vary from 28 to 69 years, the average age being 45. In eight cases the interval between the second and third test-meals exceeded two years, whilst in four a period of four years or more had elapsed. Eight were free from symptoms; indefinite subjective symptoms were present in the remaining three.

It is clear from a study of the figures obtained that the persistence of the state of achlorhydria in this small group is in no way dependent on the acid value in the pre-operative test-meal. The free hydrochloric acid value in the pre-operative meal may be as high as 0·31 per cent., and exceeds 0·2 per cent. in five instances.

GROUP 4. *Free Hydrochloric Acid Present in the Early and Absent in the Late Post-operative Test-meal.*

Nine cases fall in this group—seven males and two females. The ages range from 35 to 64 years; the average age is 47. In five instances the interval between the second and third test-meals was four years or more and it was two years in eight cases. In eight instances the free hydrochloric acid value was found to be greater than 0·1 per cent. in the early post-operative test-meal. Eight were in perfect health; the remaining patient with free acid value of 0·04 per cent. complained of vague abdominal pain coming on ten months after the operation.

Relationship between the Pre-operative and Early Post-operative Acidity.

It has been repeatedly claimed that, if gastro-jejunostomy is to cure gastric or duodenal ulceration, it must produce a state of achlorhydria as shown by test-meal immediately after operation. That a reduction in free hydrochloric acid generally occurs, and that absence of free hydrochloric acid may also be noted in the early post-operative test-meal, is admitted. This investigation, however, seems to show that undue stress has been laid on the importance of this finding in prognosis. Sherren [5] stated that gastro-jejunostomy should immediately abolish the free hydrochloric acid and diminish the total gastric acidity by one-half to two-thirds; that such a condition resulted in 90 per cent. of cases; that in these success was certain, and that the acidity remained permanently lowered. He stressed the importance of the test-meal 14 days after operation and viewed with gravity a result which showed no decrease in the acidity, and pointed out the susceptibility of such a case to anastomotic ulceration.

In the present series achlorhydria was established at the early post-operative test-meal in only 26 cases—i.e., 43 per cent. In many the reduction was not appreciable, and in five cases there was an actual increase in the acidity value at the early post-operative test-meal compared with the pre-operative value. Furthermore, these five patients remain in good health and free from symptoms after periods varying from two to five years after the operation. The average decrease in the free hydrochloric acid value amongst all the cases was 0·13 per cent. When the relationship between pre-operative test-meal and the late post-operative test-meal is considered the average decrease in free hydrochloric acid value is found to be 0·1 per cent. Nine cases showed an increase in the acid value.

Significance of Achlorhydria in Post-operative Test-meals.

Absence of free hydrochloric acid was found at the late post-operative test-meal in 20 cases—i.e., in over 33 per cent. In 11 of these achlorhydria was also found at the early post-operative test-meal and had persisted for a period varying from 12 months to eight years, whereas in 15 cases the achlorhydria recorded in the early post-operative test-meal did not persist and free hydrochloric acid was present on re-examination. These figures are in marked contrast to the results obtained by Lewisohn and Gunzberg,[6] who found absence of free hydrochloric acid at the late post-operative test-meal in only two out of 69 cases. They advocated that the operation of partial gastrectomy, which produced a state of achlorhydria in 75 per cent. of cases, should replace gastro-jejunostomy in the surgical treatment of gastric or duodenal ulceration. Hunter [7] found that complete achlorhydria resulted from gastro-jejunostomy in about 50 per cent. of cases.

The present investigation seems to establish that the operation of gastro-jejunostomy produces "temporary achlorhydria" in 25 per cent., "persistent achlorhydria" in 18 per cent., and "delayed achlorhydria" in 15 per cent. of cases. In those classified as temporary achlorhydria free hydrochloric

acid was absent in the early and present in the late post-operative test-meal. Cases showing the presence of free hydrochloric acid in the second test-meal and absence in the third are referred to as those showing delayed achlorhydria, whilst those exhibiting achlorhydria at both post-operative test-meals are the cases grouped as persistent achlorhydria.

Neutralisation of the acid gastric secretion by the regurgitation through the stoma of the alkaline contents of the duodenum is put forward by the majority of investigators to explain this post-operative state of achlorhydria. Such a theory, however, fails to explain why achlorhydria found in 15 cases at the early post-operative test-meal did not persist, why achlorhydria found at the late post-operative test-meal in nine cases was not also present at the early post-operative test-meal, and why the operation in 25 instances did not produce a state of achlorhydria either in the early or late post-operative test-meals. It is well established [7 8] that when hæmatemesis is an added factor in local disease of the stomach a reduction in the acidity value or even achlorhydria is the rule; in the same way local gastric hæmorrhage due to trauma at the time of operation may be instrumental in producing a state of achlorhydria or reduced gastric acidity in the early post-operative test-meal.

Relationship between Post-operative Acidity Value and the Patient's Health.

MacLean, Jones, and Fildes[9] state that "after a successful gastro-enterostomy the contents of the stomach are generally alkaline, or very much reduced in acidity; but should the operation afford no relief to the patient it will be found that the stomach contents still remain highly acid, such an observation suggesting that the benefit to the patient arising from a successful gastro-enterostomy is in large measure dependent on a change in reaction produced by the mechanical alterations brought about by the operation, this alteration presumably resulting from the neutralisation of the acid by the alkaline pancreatic contents, passing directly to the stomach via the stoma, such a change assisting the healing of the ulcer." Lewisohn and Gunzberg,[6] as the result of their investigation, concluded that "post-operative achlorhydria was most desirable, that a patient leaving the hospital with an absence of free hydrochloric acid is not going to have any recurrence of symptoms, and that patients in whom this achlorhydria has not been established require close observation." The results of the present investigation lend no support to these views. Hunter[7] found (*a*) that when the free hydrochloric acid was abolished 50 per cent. of the cases remained free from symptoms while others complained of pain and vomiting; (*b*) that when free hydrochloric acid was present or high, 64 per cent. remained perfectly well; and (*c*) that though high gastric acidity was a constant association of gastro-jejunal ulceration, recurrent ulcer occurred in the stomach when the free hydrochloric acid was reduced below the limits of the normal or abolished.

In order to facilitate the study of the relationship between the post-operative acidity value and the patients' health it will be convenient to arrange the cases in five groups according to their acidity values. In the first group are placed 20 cases which demonstrated achlorhydria at the late post-operative test-meal; of these 16 were free from symptoms and four had symptoms of an indefinite character. Nine cases with free hydrochloric acid under 0·09 per cent. form the second group; here seven were in perfect health whilst two complained of some abdominal discomfort at intervals. Twelve cases with free hydrochloric acid value ranging from 0·1 per cent. to 0·14 per cent. make up the third group; seven of these are without symptoms and five complained of vague abdominal discomfort in attacks, although they all stated that they were much benefited by the operation. In the fourth group are 14 cases in which free hydrochloric acid was present in a concentration of 0·15 per cent. to 0·19 per cent.; of these 11 were in perfect health, two had vague symptoms, whilst one with free hydrochloric acid value of 0·18 per cent. had symptoms which suggested the presence of an anastomotic ulcer; he gave a strong history of alcoholism and had refused to undergo another operation. In the last group are placed the remaining five cases where the free hydrochloric acid value varied from 0·2 per cent. to 0·26 per cent.; two of these complained of occasional mild indigestion and three were in perfect health. Analysis of these figures demonstrates that of the cases where the free hydrochloric acid value was less than 0·15 per cent. indefinite symptoms were present in 26 per cent. and similarly, where the free hydrochloric acid value varied from 0·15 per cent. to 0·26 per cent., vague dyspeptic symptoms occurred in 26 per cent. It appears, therefore (1) that high post-operative acidity is not incompatible with perfect health; (2) that a high post-operative acidity does not necessarily favour the production of anastomotic ulceration; and (3) that the operation of gastro-jejunostomy brings about the healing of a progressive peptic ulcer in some other way than by reducing the gastric acidity value. Lastly, it should be noted that 44 of the 60 cases remained in perfect health, the operation having thus effected a complete cure in 73 per cent. Moreover, with one exception, the remaining patients assured us that although some dyspeptic symptoms persisted, they had been able to carry out their occupations without ill-health since the operation, and were feeling very much better. It should be remembered that the percentage of cases cured would have been very much higher had the patients who refused to present themselves for the late post-operative test-meal on account of their state of well-being after the operation been included.

Effect of Alkali Therapy on Acidity Value.

It is not intended to dwell on the merits or demerits of alkalies in the treatment of gastro-duodenal ulceration, but the possibility that the administration of alkalies influenced the gastric acidity value was kept in view and a careful note was made of the therapeutic measures adopted in each case. All cases had been subjected to a course of alkali treatment for varying periods before the first or pre-operative test-meal. This treatment had been carried out either by the patient's medical attendant at home or at the out-patient department of the hospital, and in some instances in the medical wards. The alkali mixture invariably prescribed contained grs. 10 of bismuth oxycarbonate, grs. 25 of magnesium carbonate, and a similar quantity of sodium bicarbonate, and this was given three or four times daily. The pre-operative test-meal demonstrated the free hydrochloric acid value to be 0·15 per cent. or over in 51 cases and in 30 to be 0·2 per cent. or greater. In the interval between the pre-operative and early post-operative test-meals no alkalies had been prescribed in any of the cases in this series, so that any change in the acidity value at the second examination was the immediate result of the operation. After the early post-operative test-meal each patient left hospital with a month's supply of the bismuth mixture. Inquiry at the time of the third test-meal proved that the cases free from symptoms had taken no further alkalies, and those with slight subjective symptoms had taken their medicine only occasionally over short periods; in these the acidity varied. In one case, where achlorhydria was found at both post-operative test-meals, the patient had taken bismuth regularly for a period of two and a half years, but a similar state of achlorhydria had persisted in ten others who had taken no alkalies. No alkalies were administered on the day of the test-meal. It appears, therefore, that alkali therapy produces no permanent reduction in the gastric acidity value as shown by the Ewald test-meal either before or after operation.

Effect of Smoking and Alcohol on Acidity Value.

Dixon [10] pointed out that tobacco-smoking, by stimulating the autonomic system, increases the secretion of the alimentary glands, and later, after the smoking has ceased, depresses them. Hurst [11] regards tobacco-smoking as one of the most frequent causes of

hyperchlorhydria; whilst Rolleston [12] emphasises the relative sensitiveness of the individual as an important factor in determining whether or not a heavy smoker will develop symptoms of gastric disease. In the present investigation an attempt was made to discover whether smoking was a factor in influencing permanently the gastric acidity value. For this purpose the cases are classified as non-smokers, moderate smokers, and heavy smokers; 15 were non-smokers, 20 moderate, and 25 heavy smokers. The average free hydrochloric acid value in the first group was 0·05 per cent., in the second group 0·12 per cent., and in the third 0·1 per cent. This at first sight seems to indicate that the gastric acidity value is higher in smokers than in non-smokers, but such a deduction would be fallacious, since free hydrochloric acid was present in seven non-smokers, and in three of these the value exceeded 0·1 per cent., whilst achlorhydria was present in seven heavy smokers.

Similarly, attention was paid to the daily consumption of alcohol by each patient in order to ascertain its influence on gastric acidity; 22 were total abstainers, 4 were moderately heavy drinkers, and the remaining 34 took alcohol in moderation and usually only at week-ends. No definite relationship was found to exist between the intake of alcohol and the acidity value.

The "Time Factor": Its Influence on Post-operative Acidity.

The difference between the early and late post-operative acidity values was noted in each case; the mean increase or decrease was then calculated over consecutive periods of six months after the early post-operative test-meal. The results obtained were plotted and the curve demonstrated a sharp rise in the acidity value for two and a half to four and a half years after operation, followed by a rapid fall up to eight years after operation. No great importance is assigned to this curve.

Conclusions.

1. The state of achlorhydria found in the early post-operative test-meal may not, and in 58 per cent. of cases does not, persist. 2. The post-operative acidity value may in some instances exceed that found in the pre-operative test-meal, the operation, nevertheless, having completely relieved the symptoms. 3. The early post-operative test-meal taken 14 days after operation is an unreliable measure of the true post-operative gastric acidity and therefore is of no great value. 4. A persistent achlorhydria, as shown by the absence of free hydrochloric acid at both post-operative test-meals, occurs in 18 per cent. of cases. 5. The establishment of a state of achlorhydria, as found in the early post-operative test-meal, is in no way dependent on the acidity value found at the pre-operative test-meal. 6. Some factor other than the neutralisation of the acid gastric contents by regurgitation of the alkaline duodenal contents through the stoma appears to be instrumental in the lowering of the post-operative acidity value. 7. Temporary achlorhydria may be produced by the hæmorrhage incidental to the operation, and this to a large degree may account for the unreliability of the early post-operative test-meal as truly depicting the post-operative acidity value. 8. The theory that the healing of duodenal ulceration with complete alleviation of the patient's symptoms after gastro-jejunostomy is brought about by the neutralisation (partial or complete) of the gastric acidity is not borne out by the present investigation. 9. A high post-operative gastric acidity, even in concentration of 0·25 per cent. free hydrochloric acid, is not incompatible with perfect health. 10. A high post-operative gastric acidity is not a fruitful cause of anastomotic ulceration. 11. Alkali therapy, smoking, and the taking of alcohol appear to have no constant effect on the acid value as shown by the Ewald test-meal either before or after the operation. 12. It seems that the acid value tends to increase up to four years after the operation and then to decrease, but such a finding should not be unduly emphasised, as only a few patients reporting five to eight years after the operation were investigated.

We are greatly indebted to Dr. P. N. Panton, Director of the Hale Clinical Laboratory, for the analysis and estimation of the acidity in all the cases. Our gratitude and thanks are also due to the sisters of the wards, who so willingly helped with the administration of the test-meals.

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CHORDOTOMY

SECTION OF THE ANTEROLATERAL TRACTS FOR THE RELIEF OF PAIN, WITH NOTES OF SEVENTEEN CASES.

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THIS communication is a record of the operation of section of the anterolateral tracts of the spinal cord for the relief of pain. After dealing with certain points in the technique of the operation, attention will be directed especially to the cases suitable for the procedure, the immediate and later results, the extent and duration of the relief afforded, and the mortality.

The history and bibliography of the operation has been so fully set out by Donald Armour in his Lettsomian lectures [1] that it is unnecessary to refer to it here. It will suffice to say that in 1912 Spiller and Martin [2] reported a case in which the anterolateral columns of the spinal cord were divided for the relief of pain due to malignant disease.

In view of the few cases that have been reported it does not appear that the operation has been done very often, although patients for whom it may be useful are numerous enough. The following observations are based on 17 patients under my care on whom the operation has been performed since February, 1922. Eleven were suffering from inoperable carcinoma of the rectum or uterus, five from tabes dorsalis, and one from a painful stump following amputation through the hip-joint, performed for sarcoma of the femur.

The Operation.

The level at which the anterolateral columns were divided has varied with the disease from which the patient was suffering. In those who had carcinoma, the section was made opposite the sixth dorsal vertebra; in four patients who had gastric crises of tabes dorsalis the section was made opposite the third dorsal vertebra; in one who had lightning pains of tabes dorsalis in the lower limbs, the section was made opposite the fifth dorsal vertebra; and in the patient with causalgia the section was made opposite the sixth dorsal vertebra. In all the patients except the last mentioned the section was made on both sides of the cord.

The level having been decided upon the cord was exposed by laminectomy of two vertebræ. In some of the earlier cases the laminæ of three vertebræ were removed, but it was not found to make the operation easier, ample exposure being obtained through two. It was found necessary, in order that the front of

[1] THE LANCET, 1927, i., 691.
[2] Jour. Amer. Med. Assoc., 1912, lviii., 1489.

the cord could be easily seen, to remove the whole of the laminæ so that there should be no "overhang" at the sides. The dura was then incised along the whole of the exposed length and the arachnoid lifted and divided. The point of the dentate ligament nearest to the centre of the wound was caught in fine-toothed forceps and divided, and the posterior and anterior nerve roots of two segments were identified. The cord was then rotated by gentle traction on the dentate ligament until the anterior median groove could be seen. A fine grooved needle was inserted into the lateral aspect of the cord at a point midway between the posterior nerve root and the anterior median groove. The needle was passed to a depth of about 3 mm. and the handle was then raised and the point made to emerge from the cord between the anterior root and the median groove and made to engage in the dura in front of the cord. The needle served two purposes—first, to mark the limits of the section; and, second, to steady the cord while the cut was made. I am indebted to Sir Charters Symonds for suggesting this manœuvre to me. A fine von Graefe's knife was next passed along the groove of the needle, and the fibres outside the needle divided. In most of the cases there was no bleeding, but in one or two there was enough blood to obscure the field; it was found, however, that by waiting a few minutes the bleeding stopped without it being necessary to use swabs or to handle the cord. The other side of the cord was then dealt with in the same way. Some of the earlier cases complained of girdle pain at the level of the section and, to avoid this, in all the later cases the posterior nerve roots immediately above the section have been divided. The dura was closed by fine unchromicised catgut sutures and the muscles sutured in layers and the skin closed by continuous salmon gut.

The position and extent of the section of the cord made differs a little from that described by Donald Armour and other writers. With the help of Dr. J. R. Perdrau a study was made of a large number of cords in which various tracts had degenerated, and from the observations made it was concluded that all the pain fibres would be included if the knife entered midway between the posterior root and the median groove instead of midway between the anterior and posterior roots. Passing the needle as described above the cut is not carried quite so deeply into the anterior horn as is shown in Armour's diagram. The area divided is indicated in the figure, which is taken from a photomicrograph made by Dr. Perdrau. It represents a section, at the level of the fifth dorsal segment, of the spinal cord of a patient who had compression myelitis. The black lateral areas are the degenerate lateral tracts, and it will be seen that the incision clears them by a safe margin and divides the whole of the anterolateral tracts.

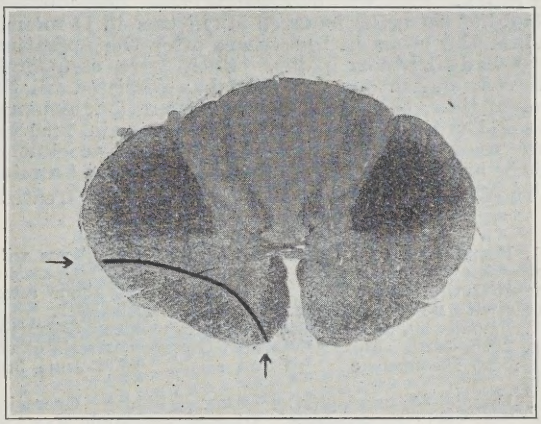
After-treatment.

After the operation the patients were kept lying down for a week, but were encouraged to turn on either side and to lie prone. Sometimes there was a tendency to retention of urine requiring the use of a catheter eight-hourly for a few days but except in one case, described below, the patients were able to pass their urine naturally within a week. As all the patients were in poor health general massage was started on the third day, and the patients were allowed out of bed at the end of a week and given general baths of ultra-violet radiation with the object of shortening convalescence as much as possible. The wounds all healed satisfactorily.

After-effects.

The operation was only undertaken in patients who had such severe pain that a major operation was justified for its relief. They were, therefore, all bad subjects for, but only two died as a result of, the operation. One died of pneumonia on the third day; Dr. Perdrau, the pathologist in this case, expressed the opinion that the pneumonia was of more than three days' duration, and that it had been overlooked before the operation. The other fatal case, a woman, aged 73, with carcinoma of the cervix, died on the seventh day of paralytic ileus; after the operation she had no pain, had no paralysis of the legs although the knee-jerks were absent, the plantar reflexes gave a flexor response, and she passed urine naturally. Her bowels, however, were obstinately constipated and resisted all efforts to overcome the ileus. It was probably inadvisable to perform the operation in so old a patient.

In two patients there was complete paralysis of the legs for a few days and in several a paresis of the legs, sometimes lasting for two or three weeks. It was noted that this paresis was most marked and prolonged in those cases in which the cord was most "handled," and in the later cases care was taken to touch the cord as little as possible. In several cases,



Section of fifth dorsal segment of a patient who had compression myelitis. The dark areas are the degenerate lateral tracts. The arrows indicate the points of entrance and emergence of the needle and the line encloses the fibres that are divided by the operation. (Photomicrograph by Dr. Perdrau.)

particularly those with tabes dorsalis root pains, at the level of the section, were severe enough to be troublesome and to require the administration of pyramidon or morphia. In only one case, however, did the root pains persist, and in that case they had lasted up to the present time, 18 months after the operation. Bedsores occurred in some of the carcinoma cases, but in none did they appear soon enough to be considered due to the operation. They only occurred when the patients were dying and did not appear worse than those which occur in patients suffering from similar disease on whom the operation had not been performed.

Relief of Pain.

The nature and purpose of the operation was carefully explained to all the patients, and in all but the two fatal cases inquiry was made as to whether they thought the relief obtained was enough to compensate them for having undergone the operation and its subsequent discomfort. In every case the reply was in the affirmative, and in many cases their replies were enthusiastic and obviously sincere. Some of them appeared to have expected too much of the operation and were disappointed when the cancerous cachexia was not relieved; it was noted, however, that owing to the relief of pain and the discontinuance of morphia which many of them had been taking there was a marked improvement for a time in the general condition.

There was sometimes complete relief from pain for many months, but in others the relief was only partial, and several stated that pain had gone from everywhere except a particular spot. One, for example, a patient with carcinoma of spine, pelvis, and other bones, secondary to a breast that had been amputated with no local recurrence, lived three years after the operation and complained of pain

at a point on the inner side of one foot. Another on whom the operation was performed for the relief of severe intrapelvic sciatic pain caused by recurrent carcinoma of the cervix that had been treated by radium, after the operation had severe pain "of a boring character" in the left great trochanter (which had not existed previously) but no pain anywhere else.

Some of the patients did not live as long after the operation as had been expected. But these were all suffering from advanced carcinoma, and prognosis in such cases is notoriously difficult. The five patients suffering from tabes dorsalis deserve separate consideration. One had complete relief of the gastric crises for which the operation was done, but died 3½ months later from pyelonephritis which antedated the operation. She was up and about, and was not incontinent between the operation and her death. Two, who had gastric crises, had complete relief, but the crises recurred in one case in 14 months and in the other in four years after the operation. Two had lightning pains. Both were completely relieved, and in one the relief has persisted till the present time, 18 months after the operation, although he still has girdle pain. In the other the pains recurred four years after the operation, and on account of this he has recently been admitted to another hospital.

The following is a brief account of the cases treated:

Malignant Disease.

1. Female, aged 39, carcinoma of cervix of uterus with metastases in lumbar spine and pelvis. Operation August 10th, 1922. Pain relieved; up and about afterwards with no incontinence. Died Nov. 20th, 1922.

2. Female, 30, carcinoma of cervix of uterus. Operation Oct. 26th, 1922. Pain relieved; temporary paresis of the legs; no incontinence; up and about. Died June 3rd, 1923.

3. Female, 47, carcinoma of cervix of uterus. Operation May 3rd, 1923; no paralysis. Died of pneumonia May 7th, 1923.

4. Female, 40, carcinoma of lumbar spine, pelvis, and other bones, secondary to a breast that had been removed. Operation May 31st, 1923; pain relieved except in one foot. Relief continued till death Feb. 11th, 1926.

5. Male, 62, carcinoma of rectum. Operation Nov. 19th, 1923; retention four days and paresis of legs till Dec. 6th. Died Dec. 26th, 1923.

6. Female, 40, painful stump after amputation through hip-joint. Operation one side only, 1923; pain relieved; six months later patient was seen and was complaining of girdle pain. Subsequent history not known.

7. Female, 73, carcinoma of cervix. Operation Feb. 18th, 1924; no retention and no paralysis of legs, but had paralytic ileus. Died Feb. 25th, 1924.

8. Female, 39, carcinoma of cervix of uterus. Operation Feb. 24th, 1926; no retention but weakness of the legs; some pain afterwards in the left leg. Died March 20th, 1927.

9. Male, 68, carcinoma of rectum. Operation March 11th, 1926; some weakness of the legs lasting for a month; retention of urine followed by cystitis. Died April 25th, 1926.

10. Female, 63, carcinoma of cervix uteri with vesical fistula. Operation August 20th, 1928; pain relieved; paresis of legs for three weeks; bedsore appeared Sept. 17th. Died Oct. 4th, 1928.

11. Female, 43, carcinoma of cervix of uterus. Operation August 22nd, 1928; retention of urine for three weeks; some weakness of legs; pain relieved. Still alive.

12. Female, 38, carcinoma of cervix of uterus, recurred, after radium treatment, in pelvis and inguinal glands. Operation Dec. 3rd, 1928; pain relieved, but now has pain in left trochanter only. Still able to be up and about.

Tabes Dorsalis.

13. Female, 38, gastric crises; cystitis and pyelonephritis. Operation Feb. 11th, 1922; pain relieved; no paralysis. Died of pyelonephritis May 23rd, 1922.

14. Male, 47, lightning pains and morphinism. Operation Nov. 13th, 1924; slight paresis of legs; relief of pain but complained of girdle pain at site of operation; pains recurred 1928.

15. Female, 42, gastric crises; had had a posterior rhizotomy done some years before. Operation May 15th, 1924; retention of urine one week; pain relieved. Seen in 1928 when she was beginning to have pain again.

16. Male, 40, gastric and "abdominal" crises. Operation Jan. 3rd, 1927; no paresis or retention; complete relief but some girdle pain. In September, 1928, again had attacks of abdominal pain which he said were as bad as they were before the operation.

17. Male, 55, lightning pains. Operation July 4th; acute mental disease with delusions and hallucinations; July 22nd mental symptoms disappeared; up and about; left hospital August 15th, 1927, with no lightning pains but girdle pain. October, 1928, still no pain except girdle pain for which he takes pyramidon.

Conclusions.

Section of the anterolateral column of the cord is an operation that may safely be undertaken for the relief of pain. Two out of 17 patients died as a result of the operation. In 15 cases a measure of relief was obtained that justified the operation. In none of the surviving cases was there any permanent ill-effect from the operation. In patients with inoperable carcinoma the relief obtained was not always complete, but such as it was it lasted as long as the patients lived. In patients with tabes dorsalis the immediate relief is good, but there is a tendency for the pain to recur a year or more after the operation.

The spinal cords of the fatal cases and of nearly all those patients who have since died of their disease were obtained and are being studied by serial sections, and it is proposed to publish an account of the findings later together with notes of the sensory changes produced by the operation.

I am indebted to Dr. C. P. Symonds, who first called my attention to the possibilities of the operation; to Dr. Perdrau, who gave me many demonstrations on his excellent collection of pathological spinal cords, and to Sir Charters Symonds for his constant encouragement and valuable suggestions.

ACTIVE IMMUNISATION AND DIPHTHERIA.

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It rarely happens, when an assumed prophylactic measure is followed by a diminution in the incidence of an infection which it was designed to prevent, that there can be any certainty whether the subsequent result was favourable because of, or in spite of, the antecedent procedure.

In the sequence of events to be described, there seems to be a high degree of probability that the disappearance of clinical diphtheria from an institution was a direct result of the artificial production of active immunity among its inhabitants. For this reason, though it would have been preferable to have waited another year in order to strengthen the evidence, we decided to publish this preliminary note at once, in the hope of encouraging any medical officer who might be hesitating to try active immunisation as a preventive measure for diphtheria.

During the years 1919 to 1927 inclusive, over 400 cases of diphtheria were notified from a residential school whose average population numbered 1000 boys of 11–16 years of age. All the usual methods failed to eradicate the infection. Massed throat swabbing of contacts and other samples had been a routine for ten years and, in addition to the notified cases, some hundreds of diphtheria carriers were isolated in the school infirmary until they were considered free from infection. Sometimes, from this cause alone, as many as 20 boys at a time might be kept from their training.

In January and February, 1928, the whole community was Schick-tested and about 300 of the boys who gave positive reactions were given a course of antidiphtheria inoculations (this original sample is now all Schick immune). In addition, all the Schick susceptibles, who were found among the new

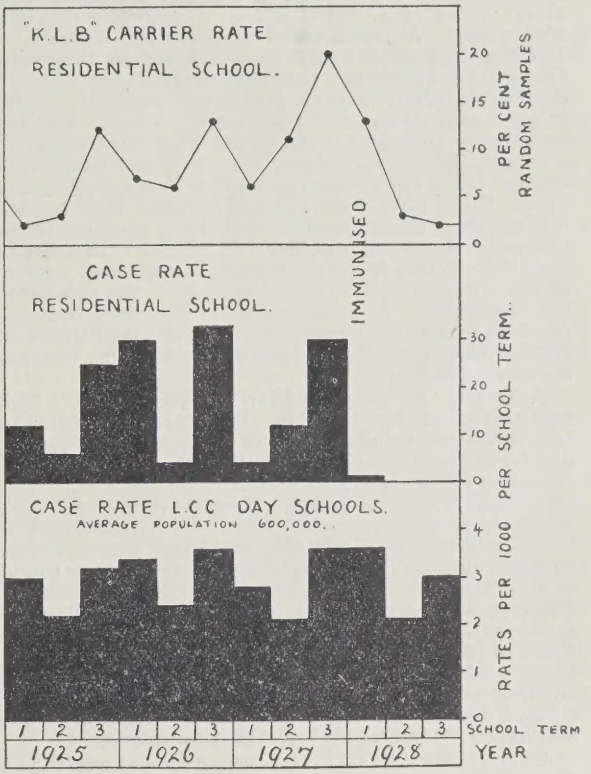
entries to the school, were also inoculated before they were allowed to mix with the more senior residents.

The incidence polygon shows that during the three years before the active immunisation of the school 43, 67, and 47 cases of diphtheria were notified. In 1928 there were only two notified cases of diphtheria. The first was reported in January before the school was protected. The other patient was a new boy who had a positive Schick test but contracted scarlet fever before he received any diphtheria prophylactic. This boy contracted diphtheria during his convalescence in the fever hospital. Therefore, since the institution of the antidiphtheria inoculations, no case of diphtheria has been notified from the school. During 1928 there were, however, four boys, the appearance of whose throats suggested a diagnosis of diphtheria. Their tonsils were covered with a thin, filmy exudate which was easily rubbed off without leaving a bleeding surface, and disappeared in all the patients within 48 hours, without the administration of diphtheria antitoxin. There was a degree or so of pyrexia but no other constitutional signs. These four boys were quite fit within a week and were not nearly as ill as the average case of follicular tonsillitis. Virulent diphtheria bacilli were isolated from only two of these cases. In the other two, repeated attempts failed to demonstrate diphtheria-like organisms in smears or cultures. It is nevertheless noteworthy that each of these four boys originally gave a Schick-positive reaction which had been rendered negative by active immunisation before the onset of symptoms. The two cases with positive throat swabs were not notified as diphtheria because, in our opinion, they were only carriers suffering from a secondary bacterial infection. But it is possible that they may have had "local" diphtheria such as has been recently discussed by Harries,[1] Neale,[2] and O'Brien, Okell, and Parish,[3] and is said to occur on rare occasions in Schick-negative reactors. These suspicious-looking throats, apart from their academic interest, illustrate two points of great practical importance. First, if a subject who is *known to have a Schick-negative reaction* has a sore-throat which suggests, but is not definitely, clinical diphtheria, there is no need for anxiety or diphtheria antitoxin. Because a case with a typical diphtheritic throat and definite toxæmia has yet to be reported in conjunction with that amount of circulatory antitoxin which is required to inhibit a properly performed Schick reaction. (One of us (S. F. D.) has discussed diphtheria in Schick-negative reactors elsewhere.[4])

Secondly, figures have been published which give the incidence of diphtheria notifications in the inoculated and unprotected members of a population. These statistics, in some cases, have not favoured the protected group as much as one would like to see. But all experience indicates that the diphtheria cases which are notified from the protected groups will, more often than not, be in the class of "local diphtheria" just described. Although anyone who has seen much "real" diphtheria would prefer to deal with 100 such "local" conditions than with half a dozen toxæmic or paralytic cases, yet one case with "local" diphtheria swells the notification returns among the protected to exactly the same extent as a fatal infection increases the incidence among the uninoculated. Even suppose the only effect of prophylactic inoculations were to increase "local" at the expense of ordinary diphtheria, without causing any reduction in the notification returns, the procedure is well worth while. Such a result would be analogous to the replacement of small-pox (variola major) by alastrim (variola minor).

The active immunisation of this school was followed by another phenomenon, which, since the difference between a case and a contact-carrier is only one of degree, was expected. Throughout 1928 random samples of 200 or more boys were swabbed at about monthly intervals in order to watch the diphtheria carrier rate. The percentage of "K.L.B. positive" examinations declined from 15 per cent. in January to 2 per cent. in December, as is seen in the diagram. For the first time in ten years, whenever the number of bacteriological examinations was large enough to be significant, the carrier incidence during the last third of the year was lowest instead of highest. This observation suggests that, provided a community is made completely Schick immune, carrier, as well as symptomatic, infections will tend to disappear.

The sequence of events in this school support the following hypothesis. Active immunisation with a diphtheria antigen tends to replace severe diphtheria



Active immunisation against diphtheria followed by a decline in the number of carriers and the obliteration of all case morbidity. (Note: Scale of L.C.C. is ten times that of residential school.)

with "local" and carrier infections, and ultimately the diphtheria bacillus, finding itself unadapted to existence in an immune herd, becomes extinct in such an environment.

Thus, in this residential school an endemicity of diphtheria equivalent to 5 per cent. per annum dropped suddenly to zero after the inoculation of the Schick susceptible members with a diphtheria prophylactic. It is important to try to decide if the above fact was in spite of, or because of, the alleged preventive measure. The arguments that could be urged in favour of coincidence as against causation are:—

1. The disappearance of symptomatic diphtheria might have been part of a general natural phenomenon, since the histogram of the morbidity from diphtheria in the London County Council schools appears to be on the decline. The decline, however, does not seem great enough to be a likely explanation of the *complete* disappearance of diphtheria from a large London institution.

2. Between 1919 and 1927 (according to the residential school records) there were three school terms out of 27 in which no case of diphtheria was notified, and during six terms (two years), previous to a big outbreak in 1921, only eight cases are recorded. Therefore, the absence of diphtheria from this school

has been seen on occasions before the institution of prophylactic inoculation. But on no occasion, for ten years previous to 1928, has diphtheria been absent for two consecutive terms; and during the two years of comparative freedom, following an epidemic in 1919, the carrier rate, based on over 1000 examinations, was less than 1 per cent., which was lower than any subsequently recorded rates where the sample contained more than 100 boys. The low incidence between 1919 and 1921 was probably due to a real scarcity of diphtheria bacilli in the environment. In 1928 over 3000 throat swabs showed 7 per cent. of carriers compared with about 5 per cent. (8000 swabs) during the previous nine years. About a third of some 200 cultures of *Bacillus diphtheriæ* which were isolated in 1928 were toxigenic; therefore, the carrier rate for virulent diphtheria bacilli averaged about 2 per cent., which implies that about 300 boys were probably infected as carriers throughout the year. Moreover, about 60 virulent diphtheria carriers were actually discovered during 1928, and, contrary to the routine of former years, these boys were neither isolated nor treated (unless their throat or nose called for surgical interference). Ignoring carriers of virulent diphtheria bacilli has been justified, because no notified case of diphtheria has arisen in the school since the procedure was instituted. It seems unlikely, therefore, that the freedom of the boys from symptomatic diphtheria in 1928 can be attributed to lack of contact with virulent diphtheria bacilli.

3. It may be possible that the confidence, which was produced by faith in the preventive value of the inoculations, changed the personal equation in diagnosis from one of overcaution to a subconscious refusal to diagnose diphtheria. This possibility was continually borne in mind. Nearly every sore-throat which was reported after active immunisation had been instituted was critically examined and swabbed to the number of 71. Diphtheria bacilli were found in four instances, a rate which was not significantly different to that prevailing among apparently healthy unselected boys during the period in which these cases of sore-throat were recorded. We do not think that, under any circumstances, these sore-throats could have been considered to include any cases of clinical diphtheria, with the possible exception of the suspicious "local cases" referred to above.

4. The rapid decline in the carrier rate, shown in the diagram, may have been a natural phenomenon, unconnected with the prophylactic inoculations and secondary to some unknown factor which was causing the diphtheria bacillus to find the infection of fresh hosts, either as cases or carriers, difficult in this environment. In spite of much cogitation, no alteration in the school conditions other than the absence of Schick susceptibles could be discovered or imagined to account for the departure of the diphtheria bacillary herd from its usual behaviour towards the human herd.

5. Perhaps the most telling argument in favour of coincidence, rather than active immunity, accounting for the absence of notified diphtheria in 1928, is the paradoxical fact that none of the Schick-positive new entries to the school contracted diphtheria before their reactions were made negative. During the year following the institution of antidiphtheria injections, 183 boys who had positive reactions joined the school, and it was fully expected that a few cases of clinical diphtheria would appear among them. The new entries to this establishment are always at first segregated in a different building for three weeks or a month before going over to the main school. During this period they received their first dose of diphtheria prophylactic. Their freedom from clinical diphtheria might be explained by supposing that those inoculated boys, in whom circulatory antitoxin had not appeared in sufficient quantity to neutralise a dose of Schick toxin, had acquired a rise in their "basal immunity" during the week or two that elapsed before they mixed with the boys already in the school. If this surmise was correct, it indicates that if active immunisation is undertaken during the course of an epidemic it may be expected to produce almost immediately a favourable effect on the severity of symptoms and incidence of all types of infection, even before there has been time for Schick-positive reactions to become negative.

The most important fact in favour of the view that the disappearance of typical clinical diphtheria was directly caused by the injections of a diphtheria antigen is, that whereas the ratio of Schick-negative reactors to Schick-positive reactors averaged 3 : 1 for five years previous to the inoculation of the school, when every allowance is made for the time required to immunise the susceptible new entries, this ratio or "herd immunity index" now averages over 30 to 1.

It seems fair to conclude from a careful sifting of all the facts that the freedom from diphtheria in an institution which had had an average morbidity of 4 per cent. for the previous ten years was a direct result of the artificial production of an active immunity, and not merely *post hoc ergo propter hoc.*

Since the chief purpose of this preliminary note is to encourage others, two other facts are relevant: (*a*) For the original Schick and prophylactic injections the permission of 1004 parents and guardians was requested. Only seven refused to allow their boys to be protected against diphtheria. (*b*) There has not been a reaction following nearly a thousand prophylactic injections that has necessitated a single boy standing off duty for a day.

We must express our thanks to Dr. R. A. O'Brien, who supplied the diphtheria prophylactics, and to Surgeon-Commander H. B. Parker, who coöperated in much of the technical work referred to in this note.

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INDUCTION OF ABORTION FROM THE PSYCHIATRIC STANDPOINT.*

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THE disorders with which the psychiatrist has to deal fall into two great groups, the psychoses or definite insanities, and the psychoneuroses or so-called "functional nervous disorders." These two groups require independent consideration with regard to the induction of abortion.

Psychoses.

The psychoses occurring in association with pregnancy may be dealt with under three headings: (1) cases where a psychosis develops after the occurrence of pregnancy; (2) cases where pregnancy arises in the course of a pre-existing psychosis; and (3) recurrent psychoses.

Cases where psychosis develops after occurrence of pregnancy.—It was formerly held that the psychoses developing during pregnancy and the puerperium were definite entities, constituting special forms of mental disorder. This view has been generally abandoned, and it is now realised that the disorders in question belong to types met with under other circumstances than pregnancy. These types fall into two groups. Firstly, diseases such as dementia præcox or manic-depressive insanity may manifest themselves during pregnancy. In these cases the pregnancy may play a part as an exciting factor determining the precise moment of the attack, but cannot, of course, be regarded as an essential cause. So far as this group is concerned it is clear that the pregnancy is only a

* Being a contribution to a discussion at the Medical Society of London on March 25th.

circumstance of minor importance, and that its removal is not likely materially to affect the course of the disorder. Clinical experience bears this out, and abortion is not therefore justifiable here from a psychiatric standpoint. Obstetric difficulties due to an exceptionally acute mental condition might a priori have to be considered, but I believe that in practice these have not been found to be very great.

The second group comprises cases of "exhaustion psychosis," a form of disorder in which toxic factors or emotional strains apparently play a decisive part. In this group the pregnancy is a factor of definite causal importance, and it might be thought that its removal would therefore clearly tend towards mental recovery. Clinical experience, however, does not support this supposition, and it has generally been noted that the induction of abortion does not materially affect the course of the disorder. On the whole, cases arising early in pregnancy tend to recover before confinement, those arising later tend to recover some time after confinement, and the duration and severity of the illness is not notably different whether abortion is carried out or not. Hence psychiatrists are increasingly reluctant to recommend termination of the pregnancy in these cases for purely psychiatric reasons, though, of course, in any individual case reasons of a non-psychiatric order may arise. Dr. Percy Smith has published an interesting series of cases from which these conclusions receive considerable support.[1] In this connexion it has been pointed out that the operation of abortion may itself be a factor tending to accentuate an exhaustion psychosis, just as does a confinement at full term, and therefore we may be adding a factor to the causes of the mental illness rather than subtracting one.

A third group should perhaps be placed here comprising those cases developing early in pregnancy where the symptoms are of a melancholic type with marked anxiety, but where there is no definite evidence of the existence of a schizophrenic or manic-depressive psychosis. The cases included here, however, seem to be merely the more extreme examples of anxiety conditions which in their milder forms belong to the psychoneuroses, and will therefore be dealt with subsequently under this latter heading.

Pregnancy arising in course of pre-existing psychosis.—The considerations mentioned in the preceding section apply with redoubled force here, and in this group it may be laid down that abortion for purely psychiatric reasons is rarely justifiable.

Recurrent psychoses.—Those cases are included here in which one or more former attacks of insanity have occurred, although at the time of the pregnancy no such attack has manifested itself. Two subgroups have to be distinguished, the first comprising those cases where the former attacks had no relation to a pregnancy, and the second those cases where a psychosis has developed in association with a former pregnancy or puerperium.

So far as the first subgroup is concerned each case must be decided on its merits. Where several attacks have occurred, generally in association with some factor of stress, then abortion would seem to be justifiable on the ground that a continuing pregnancy is likely to act as such a stress. Even here, however, experience shows that many such patients go through a pregnancy without any mental breakdown. In the second subgroup, where former attacks have occurred either during pregnancy or in the puerperium, the indications for abortion are weighty, and become greater where two or more previous pregnancies have been accompanied by mental breakdowns.

Psychoneuroses.

In considering the psychoneuroses we enter upon a much more difficult field, and one where there is no place for rigid principles and opinion.

We have to do with a sphere of disorder where psychological factors play a predominant part in causation, and amongst such factors the anxieties and fears which may centre round a pregnancy may be of fundamental importance. We may clear the ground by saying that where there is a pre-existing psychoneurosis, and where the fact of pregnancy is not itself a cause of any anxiety or fear, then there is no indication for abortion. There does not seem to be any clear evidence that pregnancy brings with it special dangers in a psychoneurotic, except in so far as its existence is a source of psychological distress. In other words, pregnancy as a merely physical phenomena is not of consequence in a psychoneurotic.

Excluding these cases, however, there are a great number in which the pregnancy itself gives rise to acute anxieties and conflicts. A multiplicity of psychological factors may be involved therein, conflicts with regard to sex, the attitude to marriage, and the relation to the husband, factors perhaps reaching far back in the history of the patient, but the pregnancy constitutes a nodal point in which all these factors are condensed, and for practical purposes it may be regarded as the immediate central factor in the production of the psychoneurotic symptoms. Here there can be no doubt that the induction of abortion will relieve the symptoms, and perhaps avert the development of a serious nervous breakdown. In cases where such a situation is obviously present it would seem that abortion is clearly justifiable, but the decision must rest on a question of degree, because we have to deal here with a series of cases ranging from the grave conditions just depicted to conditions where the patient is merely emotionally upset because an unwanted pregnancy has appeared, and nowhere in this series can a well-marked dividing line be drawn. It is pre-eminently in this series that each case has to be decided upon its merits, and it cannot be denied that the grounds are so uncertain, and there is so much room for individual differences of opinion, that there may be a risk of the practitioner being unconsciously swayed by the pressure put upon him by the patient or her relatives.

In this series of cases there is a group which stretches across the gap between the psychoneuroses and the psychoses, the group where severe anxiety conditions pass over into clinical pictures of a definitely melancholic type. Here the factor which dominates the problem at issue is the risk of suicide. There are certain cases in which the woman will remark that she would rather die than go through with the pregnancy, and where the remark may safely be neglected; but there are other cases in which the patient's terror of the ordeal before her is so potent that suicide is not an unlikely contingency. In such cases it is generally agreed that the pregnancy should be terminated, but here again it is not easy to drawn a definite line.

It has been laid down that the practitioner is "not entitled to let anything weigh with him except the health of his patient—her medical welfare as distinct from her social or economic welfare."[2] This dictum is obviously true in the present state of the law, but its application in the cases we have just considered is by no means easy. In the sphere of the psychoneuroses, where psychological factors are predominant causes of illness, social and economic circumstances may react in all sorts of ways upon the mental health, and though we may endeavour to limit our attention to the latter, the former are ranged behind it. We may decline to take them into account directly, but indirectly they may force themselves upon us.

It can only be concluded that in this group no general rule can be laid down. The attention of the psychiatrist must be focused upon the central problem of the probable effect of allowing the pregnancy to continue upon the mental and nervous health of the patient, but factors of many kinds have to be considered in determining this probable effect, and the final decision must depend upon the estimation of the force and interactions of all these factors.

[1] R. Percy Smith: Induction of Premature Labour in Relation to Mental Disease, Brit. Med. Jour., 1928, i., 9.

[2] Sir Travers Humphreys, reported in Brit. Med. Jour., 1927 i., 189. See also THE LANCET, 1927, i., 231.

Clinical and Laboratory Notes.

VISCID BLOOD AND HYPERGLYCÆMIA IN DIABETES MELLITUS.

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THE following brief account records the salient features of an unusual blood in a case of diabetes which recently came under my observation.

A woman of 62 years, weighing 10st. 6 lb., had been suffering from diabetes for about two and a quarter years before coming into hospital under my care. Her chief symptoms had been great thirst, polyuria, and loss of weight, and her doctor had prescribed a diet to which, however, she paid little attention. Increasing weakness and backache obliged her to take to bed about 11 weeks before admission to hospital. Her tongue and mouth were very dry and she would drink about 20 glasses of water daily. Her bowels had been very constipated and headache troubled her for the three to four weeks preceding admission.

On admission to hospital she was quite conscious, but slightly drowsy, and complained of thirst. She could answer questions and gave the history of her illness, although she was rather slow mentally and inclined to wander off the point. Her skin was dry and loose, temperature subnormal, pulse 112, and respirations 24. Her pupils were contracted—the right more so than left—but both reacted normally to light and on accommodation. The knee- and ankle-jerks were absent. Her lips were slightly cyanosed and she seemed just a little short of breath, but became more comfortable when propped up in bed by pillows. There was, however, no suggestion of "air-hunger," but her breath smelt of acetone. Her *urine* contained 6 per cent. of glucose and acetone and diacetic acid—both the Rothera and ferric chloride tests giving immediate strong reactions.

Blood was then withdrawn from the median basilic vein at the bend of the elbow by means of a needle and 10 c.cm. syringe. The blood did not flow spontaneously but only entered the syringe with difficulty on suction. It was very thick and very dark, its colour and consistency being almost the same as treacle. Examination by the method of Folin and Wu showed sugar present to the extent of 754 mg. per 100 c.cm.

She was given abundant fluid by the mouth, and, later, per rectum, and while waiting for the result of the blood analysis it was noticed that her drowsiness was increasing until she could only be roused with difficulty. Consequently she was given 40 units of insulin hypodermically and 20 g. of glucose by the mouth. Some three and a quarter hours later (about midnight) she was still very drowsy and stuporose, and, as the urine was found to contain acetone and diacetic acid and a large quantity of sugar, she was given another 40 units of insulin hypodermically and 20 g. of glucose by the mouth.

At 7 o'clock the next morning her general condition was much about the same and urine examination revealed 5 per cent. glucose, and immediate strong reactions were obtained with Rothera and ferric chloride tests. 40 units of insulin were given hypodermically along with 20 g. of glucose by the mouth. At 9 A.M. the urine sugar was 4·8 per cent. and the Rothera and ferric chloride tests still strongly positive. At 11 A.M. the blood-sugar was found to be normal—viz., 110 mg. per 100 c.cm.—and the blood obtained from venepuncture normal in colour and consistency and flowed easily.

The patient was now rather better but still drowsy, and through a misunderstanding, before the result of the blood-sugar examination was known, she was given another 40 units of insulin and 20 g. of glucose. She vomited the glucose, however, and at 11.30 A.M., the result of the blood-sugar examination being known, she was given 50 g. of glucose per rectum. At 12 noon the urine contained 0·2 per cent. of sugar and gave a slow weak reaction with the Rothera test and a negative ferric chloride test. At 12.30 P.M. the blood-sugar had fallen to 40 mg. per 100 c.cm., and later some hypoglycæmic symptoms appeared in the shape of flushing and sweating, but no convulsions. These were counteracted by giving glucose by the mouth and per rectum and adrenalin hypodermically.

At 4 P.M. the blood-sugar had returned to normal—120 mg. per 100 c.cm.—and a little later very marked improvement in the patient's general condition set in. At 8.30 P.M. the urine was quite free from sugar, acetone, and diacetic acid, and the patient was very well indeed. Subsequent progress was uneventful and satisfactory, but insulin treatment had to be continued (about 45 units per day).

The principal feature of the case was the condition of the blood when the patient first came under observation. Its sugar-content (754 mg. per 100 c.cm.) was exceptionally high, and this was associated with a dark, almost black, and thick, treacly condition of the blood. The patient was inclined to be drowsy at the time, but not in actual coma, and she never had "air-hunger." One would be inclined to think that a thick blood such as this must be prone to stagnation in the capillary circulation and might be responsible for some of the increasing drowsiness and torpor present.

The lips were slightly cyanosed, but there was, however, no cyanosis of the extremities, engorged veins, or other external evidence of circulatory stasis. The very quick change of the blood to normal on giving abundant fluid and insulin is another noteworthy feature.

A CASE OF INFECTION WITH *BACILLUS MORBIFICANS BOVIS* (BASENAU).

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ALL diseases caused in human beings by pathogenic organisms derived from the domestic cow are of great public health importance. The organism in this case, *B. morbificans bovis* Basenau, is one which only rarely causes infection in human beings and usually gives rise to a sudden attack of gastro-enteritis, now often termed "food poisoning." Very few references to this organism are to be found in the literature. It was first described by Basenau [1] in 1893, and was isolated from the internal organs of a cow which had been slaughtered while suffering from puerperal metritis. He noted its similarity to an organism found in another animal, the meat of which had caused an extensive outbreak of gastro-enteritis. He examined and compared this organism with others which had caused food poisoning, including *B. enteritidis* Gaertner, and concluded that its culture and pathogenicity were sufficient to distinguish it as a definite species which he named *B. morbificans bovis*.

Savage,[2] in his investigation into the presence of the Gaertner group of organisms in the animal intestine, examined the cultural and biochemical reactions of this organism. One point he noted was that, while most of the many organisms he examined were able to grow on a medium containing 0·05 per cent. of malachite green, dulcite broth, *B. morbificans bovis* failed to do so. The organism has been recognised as a distinct type of the salmonella group, and its antigenic composition has been studied in detail by Bruce White.[3] His analysis places it as a distinct diphasic type of salmonella, its specific phase being quite distinct, and its group phase showing its relationship to *B. suipestifer*, types Reading and Thompson, members of the salmonella group. Sladden and Scott [4] reported an outbreak of food poisoning in Swansea in June, 1926, probably due to pressed beef. They isolated this organism from the fæces of four of the patients attacked. Detailed examinations of the strains isolated were carried out, including analysis of the group antigen, and they confirmed the opinion of Bruce White as to the position of this organism in the salmonella group. A brief history of a recent case will show some points of interest. The onset was fairly sudden, but not of the usual food-poisoning type, and the illness was more of the

[1] Basenau: Arch. f. Hyg., 1893, xx., 242.
[2] Savage, W. G.: Local Government Board Medical Officer's Report, 1907–08, p. 425.
[3] White, Bruce P.: Med. Research Council, Special Report Series, 1926, No. 103, p. 124
[4] Sladden, A. F., and Scott, W. M.: Jour. of Hyg., 1927, xxvi., 111.

nature of a gastro-enteritis with fever. At one time the disease suggested typhoid, and later it was thought to be possibly bacillary dysentery.

The patient, a girl aged 17 years, had been working for three weeks for two or three days a week as a daily girl on a farm. No information is obtainable as to the precise source of the infection. She was taken ill on July 14th with diarrhœa and abdominal pains, and when first seen by a doctor on July 16th was in bed with a temperature of 101° F. On August 1st she was still very ill, the temperature having continued between 100° and 102°, and was having at least five motions in the 24 hours. The case was notified as a doubtful enteric on August 10th, and blood then taken was found to give no agglutination with emulsions of typhoid, paratyphoid A, and paratyphoid B bacilli. On August 14th the patient was becoming very weak, with rapid pulse and numerous loose motions, one of which contained some blood. This specimen was sent to the laboratory for examination, and in view of the negative agglutination reaction was thought that the case might possibly be one of bacillary dysentery.

After August 17th she began to improve, the temperature and pulse gradually falling to normal during the next few days. After August 23rd she was able to take more food and became convalescent, but was very emaciated. She finally made a complete recovery.

The sample of fæces arriving at the laboratory on August 16th was examined by direct plating on McConkey plates, and by the brilliant green enrichment method. Direct plates showed no non-lactose fermenting colonies, but the plates planted after brilliant green enrichment showed a few such colonies. These colonies (522) were of a motile Gram-negative bacillus which gave the sugar reaction of the salmonella group—viz., acid and gas in glucose, mannite and dulcite; no change in saccharose and lactose and slight acidity followed by alkalinity of litmus milk, and no indol (after 14 days' incubation). Gelatin was not liquefied. Broth cultures of this organism failed to agglutinate with any one of the following sera: *B. paratyphosus* B and C, *B. enteritidis* Gaertner, *B. aertrycke* Mutton and Newport, but it was agglutinated to 1 in 50 by the serum of the patient taken on August 23rd, which was again negative to typhoid and paratyphoid A and B. The organism was subcultured in broth for four days and the reaction repeated with the same result.

The following cultures and serum having been obtained from Dr. W. M. Scott, (1) *B. morb. bovis*, specific; (2) *B. morb. bovis*, Furseman specific; (3) serum *B. morb. bovis*, group and specific, it was then found that the patient's blood taken on Sept. 3rd gave the following reactions:—

—	25	50	125	250	500	0 C
Own organisms No. 522 ..	+	+	+	—	—	—
B. morb. bovis F.	+	+	+	—	—	—
B. morb. bovis	+	—	—	—	—	—

C = Control.

The titre of the serum (*B. morb. bovis*, group and specific) was found to be practically identical to the three organisms, and was as follows:—

—	Thousands.									0 C
	0·25	0·50	1·25	2·5	5	10	25	50	100	
522.. ..	+	+	+	+	+	+	±	—	—	—
B.M.B. F.	+	+	+	+	+	+	Tr.	—	—	—
B.M.B. ..	+	+	+	+	+	+	Tr.	—	—	—

In addition, after saturation of this serum with the isolated culture 522, all the agglutinins to both cultures of *B. morb. bovis* were removed (from dilution of 1 in 250) as well as for the culture 522 itself. It was further noted that the organism 522 rapidly fermented inosite (24 hours) with the production of acid, but only very little gas, the stock cultures giving similar results but with more gas-production. Arabinose was also fermented with the production of acid and gas in 24 hours, and lead acetate broth was blackened. It is of interest to note that, as we have previously found with other members of the salmonella group, brilliant green enrichment (1 in 200,000) facilitated the isolation of the organisms.

I wish to thank Dr. J. G. Walker, medical officer of health for Lanchester, Co. Durham, for the history and specimens, and Dr. W. M. Scott, of the Ministry of Health, for cultures and serum of *B. morbificans bovis*.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF UROLOGY, PATHOLOGY AND THERAPEUTICS.

A JOINT meeting of these Sections was held on March 21st, Mr. SWIFT JOLY, President of the Section of Urology, in the chair. Dr. W. LANGDON BROWN opened a discussion on

URINARY ANTISEPTICS.

He said that it would be convenient if the term "bacilluria" were reserved for the passage of bacteria through the renal system without inflammatory reaction, which was constantly occurring and called for no treatment. When pus accompanied bacteria in the urine some inflammatory condition had been set up and needed treatment. Bacilluria might be turned into cystitis by any obstruction to the flow; by an organic lesion of the nervous system; by trauma, such as a blow over the kidney in football, and by focal sepsis. In the last-named the best treatment was to deal with the source of the trouble. The large intestine provided a source of extended sepsis, especially if there were some obstruction such as diverticulitis, and the relation of the hepatic flexure to the right kidney made infection by this route easy. In these cases intestinal antiseptics, kaolin, and Plombières douches were as important as treatment of the urinary tract. The only organisms of practical importance for renal infections were the *Bacillus coli*, *B. proteus*, streptococci, staphylococci, gonococci, and the tubercle bacillus. Ascending infection was more common in women and babies; the colon bacillus was said to inhabit the vulva of 50 per cent. of normal women. It was rare in men, but in either sex might arise from the peri-urethral lymphatics. There was an enormous preponderance of *B. coli* infections, but it was important to guard against concluding that a case was one of simple *B. coli* infection because only coliform bacilli were found in the urine; a tuberculous infection or a new growth might be concealed behind this. As a general rule a case that proved very resistant to treatment, in that signs and symptoms persisted, should not be regarded as a simple infection. There was some doubt whether the "coliform" infection was really the ordinary *B. coli communis* or some organism like it, but, as it had been shown that the bacillus in the urine might be strongly hæmolytic at the height of the infection and gradually return to a form typical of *B. coli communis*, it was hard to resist the conclusion that the ordinary bacillus could produce pathogenic effects when outside its normal environment.

Antiseptics in Common Use.

Many substances had been found successful in vitro that were not so good clinically; the bladder, unfortunately, was not lined with glass. The benefits of intravenous administration were not solely due to the germicidal action of the drug. H. H. Dale thought that they were partly due to modification of virulence or lowering of the resistance of the invader to the natural defences, partly to the formation in the body of some substance directly antagonistic to the germ, and partly to the formation of a depôt from which a curative substance was slowly distilled. Mercurochrome and gentian violet were the substances chiefly used; at the Mayo clinic the former was given in doses of 4 mg. per kg. of body-weight in 1 per cent. solution, but even this dose occasionally led to rigors, vomiting, and diarrhœa, and should only be used as a last resort. Helmholz and Field maintained that hexamine was definitely superior; Braasch and Bumpus claimed good results from doses of 5 c.cm. of a 10 per cent. solution. It was extraordinary how little general agreement there was as

to the efficacy of the various drugs given orally for urinary antisepsis. *Hexamine* was rapidly absorbed and appeared in the urine, bile, and cerebro-spinal fluid about 20 minutes after administration. It was said to form formaldehyde in an acid urine, but if so there seemed no reason why it did not also form formaldehyde in the presence of the gastric hydrochloric acid. At any rate, the amount liberated was small, and some authorities said that the patient found the drug intolerable just as soon as the formaldehyde began to appear. No doubt hexamine could be very irritating and cause hæmaturia. Dr. Langdon Brown had found it less irritating when given with methylene-blue; the combination diminished subjective symptoms and reduced the amount of pus and organisms, but the infection persisted. *Acid sodium phosphate* had been recommended by R. Hutchison as the natural acidifying agent; only half the dose was absorbed, the rest passing out through the bowel. This drug could prevent the post-prandial alkaline tide and the slow ammoniacal decomposition resulting from bacterial infection, though it could not correct a strongly ammoniacal urine. It was usually given with hexamine. Blaustein held that calcium and ammonium *chlorides* were stronger acidifiers in an alkaline cystitis; he gave ammonium chloride in doses of grs. 15, t.d.s., up to grs. 30 every three hours. *Benzoic acid* was synthesised in the kidney with glycin and excreted as hippuric acid which, according to Stockman, took up so much alkali to be excreted as hippurate that more phosphate was able to take the form of acid phosphate. The ammonia split off from urea by ammoniacal decomposition combined with this acid salt and the urine became clear. Stockman preferred to give *ammonium hippurate*, as a smaller dose of this was effective. The latest drug was *hexyl resorcinol;* this was inactive when given with sodium bicarbonate—according to Leonard and Frobisher because of alteration of surface tension, so that the drug could not enter the crevices of the mucosa. In any case most of the drug was conjugated and only small amounts excreted in an active form. Great claims were made for it which, if justified, were some set-off for its prohibitive cost. D. A. Brown had said that the chief feature was relief of bladder irritations; he gave it in 0·15 g. capsules, 9 to 12 a day for 7 to 30 days in acute cases and 30 to 60 days in chronic cases. Half the patients had suffered from gastro-intestinal disturbance. Stockman agreed that it reduced the number of organisms and the symptoms, but did not find it effective in eradicating the infection. *Salicylic acid* was never found free in the urine, being excreted as inert salicyluric acid. Salol appeared as sodium salicylurate and sulphocarbolate. Stockman was unable to understand the reputation of salol as a urinary antiseptic; it might perhaps be due to its action as an intestinal antiseptic. *Boric acid*, given in five-grain doses, was a weak antiseptic in both acid and alkaline urine. It was best given in keratin capsules together with salol, and seemed to relieve the symptoms of chronic *B. coli* infection. *Acriflavine*, a grain and a half three times a day in keratin capsule, had been recommended by Browning and Gulbransen. The difficulty was to get the keratin the right thickness; if the drug was absorbed successfully it gave the urine a deep yellow colour. *Copaiba* and *sandalwood oil* had been used, and sometimes relieved the symptoms; they were most useful in gonococcal cystitis.

Change of Reaction, Vaccines, Lavage.

One of the most important methods of treatment was to change the reaction of the urine, altering the habitat which suited the microbe in question. It was easier to make an acid urine alkaline than vice versa. The patient found alkalis more tolerable in acute infections. Potassium citrate and sodium bicarbonate on the one hand, and ammonium and calcium chloride and acid sodium phosphate on the other, were used to make the change; it might be necessary to change the reaction more than once. We needed to know a great deal more about the urine reaction; some urines became sterile by themselves if obstruction were removed. Large quantities of water were useful, but should not, of course, be prescribed while an attempt was being made to sterilise the urine by antiseptics. Vaccines never made the urine sterile, but might relieve a toxæmia; they were more successful in coliform than in coccal infections. Dr. Langdon Brown said he had sometimes been greatly impressed by the effects of lavage, application of silver nitrate, and irrigation of the renal pelvis. Any case which did not respond rapidly to medical measures should be examined by the cystoscope.

A Pathological Experiment.

Dr. CUTHBERT DUKES described an investigation into the value of urinary antiseptics in 28 cases of cystitis produced by a tie-in catheter in patients whose rectum had been excised for carcinoma. The cystitis had appeared invariably in four or five days so long as the catheter had been stopped with a wooden peg, the infection arising at the junction of peg and catheter and spreading up the column of urine in the catheter. There had been no symptoms except irritability of the bladder; in the early stages the organisms were pyogenic cocci, usually staphylococci, but in the later stages coliform organisms had predominated on agar culture, though the cocci remained predominant in broth. Mild uncomplicated cases recovered without treatment in four to six weeks. The effects of the antiseptics had been judged by clinical observation, by daily quantitative estimations of pus in the urine, and by repeated bacteriological examinations. The amount of pus had been found to be an expression of the nature and not of the severity of the infection. Of seven cases treated with hexyl resorcinol, one recovered in 30 days and another in 25 days; the remaining five derived no benefit. Of 12 cases treated with hexamine only one recovered more rapidly than was expected. Most of the patients complained of the discomfort of the treatment. In four cases treated with methylene-blue there was no sign of any benefit. The best results were obtained in five cases treated with alkalis, which made the patient more comfortable and might perhaps shorten the natural duration. At present the best treatment for catheter cystitis was to give non-stimulating diet with large quantities of water and to keep the urine faintly alkaline to litmus. A glass of water should be drunk every hour; no medicine was required at all if the urine were already alkaline.

Discussion.

Dr. PHILIP HAMILL pointed out that few coccal cases fell to the lot of the ordinary physician, who generally found that he could not push hexamine and acid medication because of the pain. He had been satisfied that cases cleared up just as quickly on water alone. The great value of alkaline treatment was that it rendered micturition painless, so that the patient could be persuaded to take fluids. Methylene-blue made the patient more comfortable, and so did flavine and caprokol, but the former did not reduce the pus. Dr. Hamill then described some experiments on the cultivation of organisms with the urine of a normal subject who had taken hexyl resorcinol. They showed that the urine became very highly bactericidal to *Staphylococcus aureus*, but had no antiseptic effect on *B. coli* until it became fairly alkaline.

Mr. F. A. JEANS said that in his experience hexamine made tuberculous kidneys worse. It was only irritating if there were no albumin to counteract it; if the pelvis were full of pus, formaldehyde caused no discomfort. Empirically it was a good thing to alter the reaction of the urine, whichever it was.

Dr. L. P. GARROD said that colon bacilli grew very much faster in alkaline than in acid urine, and that this was not due to nutrient substances present at the time of the alkaline tide after meals. To interfere with the growth of *B. coli* in urine the urine must

be made strongly acid, but this caused the patient too much discomfort. The growth of organisms in the sterile urine of a normal person who had taken an antiseptic drug would give an accurate idea of the value of the drug in question.

Mr. F. E. FEILDEN said that few conditions were more difficult to treat than uncomplicated *B. coli* infection; in his experience hexamine, acid sodium phosphate and flavine were the best drugs. Hexamine accentuated the symptoms in many cases, and he had been more impressed by flavine, in doses of half a grain three times a day, with an alkali. Amounts of 1 in 300,000 were enough to inhibit the growth of the gonococcus.

Dr. KINGSTON BARTON held that the easiest and most comfortable drug to give was hexamine, but the acidity of the urine must be known. It should never be given in large doses, especially at night, but in small amounts every few hours, for it passed through very quickly. The more of it that was given before noon, the more efficacious it was. Formalin must get into the gastro-intestinal tract, for many patients complained of "indigestion" when taking hexamine. This could be obviated by giving the drug before meals.

Mr. JOHN EVERIDGE said that without question hexamine was a most valuable drug, and gained additional value by being given about an hour after the acid sodium phosphate. The urologist frequently tied in a catheter, but did not get catheter-cystitis; he wondered if the infection described by Dr. Dukes was really a urethritis. Hexamine was believed to fail in pyelitis because it did not remain long enough in contact with the inflamed area; this might also apply to urethritis.

Dr. GEORGE GRAHAM thought there was no scientific evidence for the value of hexamine, which he no longer used. It was often given with an alkali or in alkaline urine, and it was the alkali that did the good.

Dr. ELIZABETH LEPPER said that experiments she had done had shown that hexamine was on the borderline of useful antiseptics. Just enough of it was dissociated in the urine to produce some effect; probably it acted on some coliform organisms and failed to touch other more resistant strains.

The PRESIDENT said that he had become very pessimistic about chronic infections of the kidney; if they persisted more than a few months they would persist indefinitely, become bilateral, and eventually kill the patient. Coccal infection with renal stone called either for primary nephrectomy or at any rate for removal of the kidney if the infection persisted a year after removal of the stone.

Dr. LANGDON BROWN, replying, said that there was, in fact, very little satisfactory pathological evidence of the efficacy of the drugs in common use, but there was a good deal of clinical evidence that the patient could be made comfortable.

Dr. DUKES, in reply, emphasised that his results must only be taken to apply to the particular form of catheter cystitis in question; he was convinced that it was a cystitis and not a urethritis. It might spread to the kidneys and cause grave complications. Though symptomless, it produced much ill-health.

SECTIONS OF DERMATOLOGY AND EPIDEMIOLOGY.

ON March 21st a joint meeting of these Sections was held, with Dr. J. M. H. MACLEOD, President of the Section of Dermatology, in the chair, to discuss the Causation, Recognition, Prevention, and Treatment of

INDUSTRIAL DERMATOSES.

The CHAIRMAN said the subject was important not only to the medical profession, but to the whole industrial world. If, as a result of the discussion, a keener interest was aroused in the problems of industrial dermatitis and methods of prevention, it would have served a very useful purpose. Celsus and Agricola referred to the dangers of ulceration of the skin from contact with corrosives. Agricola also mentioned the baneful action of a kind of "cadmia," which Mr. Hoover, President of the United States and a distinguished modern engineer, recognised as arsenical cobalt. Robert Willan was the first to describe the psoriasis palmaris of shoemakers, dermatoses in metal workers, grocers' itch, and washerwomen's eczema.

Dr. SIBYL OVERTON began by speaking of the growing importance of these dermatoses, both to the nation and the individual. Many thousand man-hours were lost annually through this form of disability, and even one attack of dermatitis might prevent a skilled worker from pursuing his trade again. In 1927 a minimum of 3000 days' work was lost on account of trade dermatitis in factories. Since the passing of the Workmen's Compensation Act in 1906 the claims on this account had largely increased. In 1908 the claims numbered 19, on account of eczematous ulceration of the skin, while in 1927 the figure had risen to 897. The number of substances being used in various manufactures had largely increased of late, as had the proportion of skin irritants so used. The most important single event in the causation of these dermatoses was injury to, or destruction or separation of, the horn cells of the epidermis. A prominent place in the ætiology was taken by alkalis; the horn cells were more tolerant of acids, in the stronger solutions, than of alkalis. In bakers' dermatitis the phosphoric acid in the sweat was said to form acid aldehyde which, in the presence of oxygen, broke down to produce formic acid. Over-lubrication of the skin by oil served to swell the number of cases. Dermatitis levied a heavy toll on engineers, perhaps because of the fine particles of metal in the oily mixtures handled. The dyeing industry and calico-printing were responsible for many cases of trade dermatitis annually. Painters acquired skin disease not from their paint, but from the turpentine and its substitutes they used to remove paint from hands and arms after work; the paraffin so used took its place among the irritative agents. She suggested that here there was scope for the work of the experienced chemist. Cotton-seed oil was a good substitute for more irritating cleansers.

As a result of inquiry into thousands of cases the conclusion reached was that most of these cases were preventable. More knowledge was needed of harmless yet effective methods of removing stains from the skin, and certainly there should be a daily removal of irritants from the surfaces concerned. The prime object was always to preserve the protective layer of horn cells. Emollients should be used before and after work. After work any irritant must be completely removed by harmless methods. An experienced observer should be allotted the task of inspecting the hands and arms of the workers with power to enforce the early treatment of minor injuries, such as cuts and burns. Dermatitis was often preceded by such small damage, and this damage was often the starting place for the more widespread skin eruption. Hands, arms, and overalls must be scrupulously cleansed on leaving work. Forearms were often rubbed over with a contaminated overall. After the Government Order of 1919 cases still continued to come up, but there was a steady diminution. In wet processes the feet and legs were often the parts first affected. Patent cleaners for boots and shoes contained ammonia, and cases of dermatosis were attributed to that, and also to the oil used by tobacco workers.

Dr. WILLIAM DYSON (Manchester) confined his attention to cases whose condition was, clinically and histologically, indistinguishable from the dermatitis known as eczema—in other words, a superficial non-microbic inflammation of the skin caused by external irritation in a predisposed subject. It was commonly seen in bleachers, dye-workers, chemical workers, plasterers, French polishers, and hair-dressers. The predisposing causes of this must be held to be hyperidrosis, xeroderma, ichthyosis, senile degenerative changes, debility, tuberculosis, anæmia. Once the condition had been set up in a person relapses

were frequent, and the question of relapse brought into the discussion that of sensitisation. Sensitisation to a specific irritant was very rare in trade dermatitis; but a general supersensitiveness of the skin after long-standing or repeated attacks of dermatitis was common. This was certainly contributed to by the absorption of toxins through inflamed and damaged epithelium. In over 50 cases he had had blood-sugar estimations done, and the results suggested that when sensitisation was present a high blood-sugar was to be expected. Also that when the products of inflamed epithelium were being absorbed, the blood-sugar content was higher than when these products were being discharged on the surface. On the hypothesis that this supersensitiveness might be an anaphylactic phenomenon, he had treated 17 patients with injections of their own blood so as to produce an anaphylactic state. Fifteen of these cases had suffered from relapsing dermatitis, for periods ranging from three months to 20 years. The result of this procedure was much the same as that from small doses of X rays—namely, the production of an antianaphylactic state. He considered that the prognosis in a first attack of this dermatitis was good in the absence of an obvious predisposing cause; it was bad if of long standing or if there had been repeated attacks. For prevention, or lessening the incidence, he advocated medical examination before a man was employed, and a periodic inspection of all the factory's employees.

Dr. N. HOWARD MUMMERY spoke of industrial dermatoses as seen in the clinic of a large food manufacturing and catering firm, which also carried out transport on a large scale. His aim as medical officer to that firm was to prevent recurrence of these dermatoses, and to make the period of absence from work as brief as possible. He sent to hospital only such cases as seemed to need in-patient treatment. The employers' liability in respect of these dermatoses did not seem to rest on any scientific or practical basis, but rather upon certified opinions of private or panel medical practitioners or factory surgeons, who in the main had an inadequate knowledge of these diseases. His own view was that most dermatoses met with in industry were not due to the employment, neither were they more prevalent in industrial than in other walks of life. Rather were they due to constitutional susceptibilities of all degrees. Exclusion from a particular employment of those unfitted for it was a first necessary step. He rejected from duties requiring the handling of food all who had a skin disease, and those showing marks of seborrhœic and other states. The commonest predisposer to dermatitis was an unusually dry and inelastic skin. For many years he had carried out at the firm in question a weekly inspection of the workers. The initial lesion was a dry patch of interdigital or extensor coccogenic eczema. He recently had two cases arising from the cheese used in the production of Welsh rarebit. A person might work in a factory for years without skin trouble, and then suddenly develop a dermatitis, without having had any change of occupation. When that subsided he might remain clear for another series of years. Usually he had concluded that the fault lay with the worker rather than with his work. He did not think bakers' itch could be regarded as a clinical entity, and cases of it were rare in a modern bakery. In the staff of 5000 there had been 170 cases of skin disease in one year, and the lost time on that account averaged 18 days per case.

Dr. HENRY MACCORMAC submitted that there were two groups of cases. In one, the eruption was due to a known external agent, the reaction from that agent being of a specific type; instances were chromium ulceration and tar-workers' cancer. In the second group were cases much more difficult to understand. They were the non-specific types of eruption, generally eczematous, which occurred in people working at various occupations. Examples of this were bakers' and grocers' dermatitis. In many of the cases in this class it seemed likely that the patients were people who developed eczema while working at a certain trade; whether the work caused the eczema was not clear. He tried to arrive at some conclusions about this second group by inquiring among photographers who used metol or amidol. In one firm there were four men. One of them worked for ten years and kept free from dermatitis; another worked there six years before developing it, and since then had kept himself free by wearing gloves; another worked five years with freedom; another worked three years, had an attack after the first year, and was able to protect himself with gloves. The head of one firm said he had himself worked with metol for 20 years and had been quite free from any eruption; but on two occasions while on holiday he had developed eczema. If this eczema had occurred during his work it would probably have been attributed to the chemical. In one large school of photography 250 students had been constantly working at photography with metol and amidol, but there were only four cases of dermatitis, probably due to amidol. He carried out cutaneous tests in two of the cases, and neither of them gave evidence of specific sensitisation to metol.

Sir THOMAS LEGGE said there were people, incapacitated by trade dermatitis, who were receiving no compensation for it, simply because they did not know how to get it. Some were receiving the best form of treatment, but had been told nothing about the compensation to which they were entitled. Application to the certifying factory surgeon for the district, with the payment of 5*s*., was the only formality required. He urged that it was the duty of the doctor seeing such cases to tell the patients what they were were entitled to. Dr. Howard Mummery had shown how much good could be done by whole-time medical officers of factories; but how many factories had a whole-time doctor?—probably not 50 in the whole country.

Dr. W. J. O'DONOVAN said he feared that if this matter had been solely in the hands of the professional dermatologist the great mass of occupational dermatitis would have remained undiscovered. Now, however, the pendulum seemed to be swinging in the wrong direction, resulting in the figures being inflated. A prominent cause of this was the incursion of administrators, lawyers, and accountants. If a workman presented a certificate stating that he could not work because of dermatitis, he was at once asked (with a strong suggestion that dermatitis was usually occupational) to go to the certifying surgeon. In this way cases were almost forced into the occupational group. He had in his ward cases of chilblains and lupus erythematosus which had been certified as of occupational cause.

Dr. R. PROSSER WHITE agreed about the importance of the horn cells of the epidermis as a barrier against dermatitis and infection. He was convinced, however, that it was necessary to know the exact physico-chemical action on the skin of the particular drug used. The reason alkalis loomed so large in the causation of these dermatoses was that alkalis were solvents of the horn cells. The question of sensitisation was a very difficult one, but he thought the present tendency was not to assign a very great importance to it.

Dr. ALLAN PARSONS referred to an investigation of bakers' itch which he had carried out a few years ago for the Ministry of Health. Dr. Overton's remarks had convinced him that this subject was being carefully watched. He had also inquired into the dermatitis which occurred among hop-pickers. These people suffered from cracks and abrasions of the skin due to pulling the hops off the vines. A band of workers was giving attention to the subject.

Dr. G. H. LANCASHIRE gave an analysis of 100 cases, diagnosed as occupational dermatitis, which he had examined; 13 per cent. were not due to trade conditions, though they were certified to be so by the factory inspector; 20 per cent. of the cases were due to exposure to aniline dyes; 7 per cent. to bakers' itch; 18 per cent. were in rubber workers; 12 per cent. were among painters, largely due to turpentine or its substitutes, used for hand cleansing after work. Other trades represented in the list were cement

workers, hairdressers, grocers, electro-platers, brass-tube moulders.

Dr. F. E. FREMANTLE (President of the Section of Epidemiology), proposing a cordial vote of thanks to the speakers, referred to the value of the Society as a body of experts to whom the Government could refer on subjects such as that now discussed. He hoped this would be done in the future in increasing degree.

MEDICO-LEGAL SOCIETY.

AT a meeting of this Society on March 21st, the chair was taken by Sir WILLIAM WILLCOX, the President, and a paper on the

INVESTIGATION OF FIRE-ARM INJURIES

was read by Prof. SYDNEY SMITH. The investigator, he said, often wanted to know whether a given injury was due to fire-arms or not; the type of fire-arm responsible; the direction taken by the shot, and the distance of the muzzle from the body. Sometimes it was necessary to say whether one particular weapon had been used. The effects of fire-arms were very variable; a rifle bullet at the beginning of its trajectory, before it had settled into its regular spin, would wobble and cause a wound like a severe explosive injury; similarly a spent bullet, turning over and over, would cause injuries quite unlike those of a bullet wound. A small high-velocity bullet bored a clean hole; a slow large bullet often made a ragged one. Besides the projectile, the weapon produced a wave of gas, wads, unburnt powder, smoke, and flame, all of which (when the discharge was close enough) left their distinctive marks to aid diagnosis. Powder made tattoo-like marks on the skin, and left traces which could be chemically analysed. At a slightly longer range the wound made by a rifle bullet was a round, clean, punched-out hole surrounded by a zone of tissue denuded of its epithelium but showing little sign of blackening or burning; outside this there might be powder-tattooing. The hole itself might be surrounded by a black ring due to fouling from the bullet; this was sometimes mistaken for powder-marking. Local bruising due to hydrostatic pressure was also apt to be mistaken for the marks of a close discharge. These distinctions were important, as they might turn the scale between the theories of suicide or murder. Automatic pistols caused very much less blackening and burning than any other type of weapon, because of the completeness of the combustion of their "smokeless" powder. They produced a typical clean entrance wound. Exit wounds were nearly always torn, as the bullet was forced through the tissues. A low-velocity bullet caused the same kind of wound that might be made by a poke from a stick. In bone, such as that of the skull, the entrance was clean-cut and the exit had an excavated appearance. A line between entrance and exit, if produced, nearly always gave a good indication of the track of the bullet, but deviation sometimes occurred within the body if the projectile struck a bone. The appearance might give a guide to the direction; when the bullet entered at an angle the wound tended to be oval, and if the discharge had been at close range there might be much bruising and burning on the angle of fire. A shot-gun discharged within one yard caused a single wound, and within three yards slight scattering with burning and blackening, but above that distance the wounds of the separate shot were discrete and there was little discoloration. A sharp-pointed bullet might often inflict a wound very like that of a stabbing weapon, but the latter when pulled out tended to disturb the tissues, and their outward deviation distinguished the stab from the bullet wound. In bone the excavation effect of the dagger would be both inwards and outwards. Bullet wounds made at an angle might simulate cuts, but some portion of the tissue was generally removed, and there was often denudation of epithelium and bruising. Moreover, the bullet often left metallic traces. Bullets were sometimes marked by the cloth through which they passed. X rays were often valuable in demonstrating the absence of a bullet where the site of entrance escaped notice, or when great deviation had occurred within the body. When more than one injury was found it was important to pay careful attention to all the anatomical possibilities before deciding whether one projectile or more had been responsible. A bullet had been known to pass in a straight line through the back of a running man, through his abdomen, into the front of his leg, and remain embedded in the back of the leg.

Identification of Fire-arms.

Even if no projectile were found, a chemical and microscopical examination of the traces of metal and powder at the wound might give a clue to the kind of weapon which had been used. Some powders were filled with barium or bichromate. If an automatic pistol had been used, cartridge cases were often found at the scene of the crime, and the marks on the sides of these caused by the action of the weapon might be sufficient to identify one particular fire-arm. The distinguishing marks on a cartridge-case fired in an ordinary revolver were mostly on the base. A bullet which had passed through the bore of a weapon received not only the marks of the rifling, but also many minute scratches caused by individual faults. From the gross markings it was generally possible to tell the type of weapon which had been used, while from the smaller individual markings it was possible to prove whether or not a given weapon had fired the bullet. A bullet found in the body was weighed, had its specific gravity estimated, and its base examined for signs of the maker's name. The tip sometimes showed other signs which might identify it. The murderers of Sir Oliver Lee Stack in Cairo had been detected entirely by this means, and certain instruments with which they had notched the tips of their bullets had been found with metal still adhering that was identical with that of the bullets used. The apparatus used for the identification of bullets consisted of two microscopes fitted with a common eyepiece, so that the images of the two bullets to be compared were shown side by side. For macroscopic examination bullets were rolled on a sheet of plasticine; rifling was examined by taking a casting in sulphur and rolling the casting on plasticine. Bullets, however, were not always fired from weapons of the same calibre as themselves; a small bullet might be made to fit a large barrel by wrapping it in paper.

Some Extraordinary Projectiles.

Criminals had been known to pick up a bullet on a rifle range and fire it from a shot-gun. In one victim's body the investigators had found two shilling-pieces; the bullet had struck them when they were in his pocket and had driven them in without itself entering. A shot fired at a railway train had entered the dining-car and nearly killed an important personage. The projectile found had puzzled the officials, for it had appeared to be made of bronze, and to be roughly of 16-calibre. Many persons had been arrested, and all the guns in the district had been examined for traces of a bronze bullet. Closer examination, however, had shown that the projectile was flat on one side and rounded on the other, and that it had a splash of lead at its base. It had proved, in fact, to be a fragment punched cleanly out of a hinge of the table in the dining-car. The actual bullet had then passed through the door of the carriage. Traces of lead had been found, and also traces of some other substance which had at first been thought to be cupro-nickel and which had suggested a rifle bullet. This had thrown suspicion on the troops in the district, but analysis had proved the substance to be steel, a fact which had shown conclusively that the assailant had been the owner

of some continental ammunition which was known to possess a steel casing.

Sometimes metallic traces, too small in amount to be analysed, could be identified by means of the spectograph, but this method was still in its infancy.

A brief discussion followed, in which Mr. J. H. RYFFEL, Dr. MORGAN FINUCANE, Mr. BARRY O'BRIEN, Mr. W. M. WALKER, and the PRESIDENT took part; Prof. SMITH replied.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society held on March 25th, the chair was taken by Dr. WALTER CARR, the President, and a discussion on the

MEDICAL INDICATIONS FOR THE INDUCTION OF ABORTION AND PREMATURE LABOUR

was opened by Mr. EARDLEY HOLLAND. Reviewing the legal and ethical position, he pointed out that the only lawful object of abortion was to save the mother's life or prevent serious injury to her health. The medical profession was trusted implicity and given the widest possible freedom of judgment. It had never been practicable to lay down strict rules for the medical indications, which had changed as medicine had advanced. The advent of insulin, for example, had made possible many pregnancies in diabetic women. Great difficulties occurred when social, personal, and economical factors added their weight to a medical indication which in itself might seem inadequate. The ethical standard had not been lowered by modern practitioners, but the modern gynæcologist was less fitted than his predecessors to form an opinion on the indications for abortion because he leaned more towards surgery and less towards medicine.

The medical indications might be classed as: (1) positive indications, (2) debatable indications, and (3) a heterogeneous and unclassifiable collection of combined medical, personal, and social considerations. Among the *positive* Mr. Holland put hyperemesis gravidarum of the toxæmic type; acute and chronic nephritis; chronic valvular disease of the heart with failure of compensation; pulmonary tuberculosis (about which there was great difference of opinion); Graves's disease; insanity, and certain cases of *Bacillus coli* pyelitis, which did not yield to treatment. The *debatable* indications included multiple arthritis deformans during pregnancy; hypothyroidism, such as early myxœdema; hyperthyroidism; albuminuria of pregnancy; eclampsia in a former pregnancy (a somewhat slender reason); certain cases of cardiac disease, and slight cases of pulmonary tuberculosis which might have a bad effect on pregnancy; former puerperal insanity; severe nervous or mental disturbances in early pregnancy due to fear in a former confinement, and as a better alternative to Cæsarean section than craniotomy. Very debatable were a new class of eugenical indications which might be termed "*fœtal.*" One of these was refractory syphilis, as for example in a case where, in a former pregnancy, the Wassermann reaction could not be brought to negative except by what was practically an overdose of arsenobenzene. Another was idiopathic epilepsy in the husband. It was interesting to contrast the hospital figures with those of private practice; the former showed a great preponderance of "positive" indications. From 1924 to 1927 inclusive, out of 4000 gynæcological operations, only thirty-one had been for the induction of abortion. Twenty-nine of the operations had been undertaken for "positive" reasons; eight of these had been for uncompensated cardiac disease, six for pulmonary tuberculosis, four each for nephritis and Graves's disease, and the remaining five for hyper- and hypothyroidism, tuberculous disease of the bladder, congenital syphilis. One had been for mental disorder in a previous pregnancy, and only one, on the grounds of "general bad health," came into the "doubtful" category. In the speaker's private practice of about 3500 patients he had induced abortion on twenty-eight occasions since 1919. The number of inductions performed for positive reasons had been only 19, a much lower proportion than in hospital. The grounds had been very varied. Of the six operations where the indications were debatable one had been on a woman of 45 suffering from debility, who had undergone a severe operation for an infected gall-bladder two years before and who had a family history of tuberculosis, and one on a patient just recovering from a long series of severe ailments which showed a very bad state of general health, and who had complained of exhaustion and rapid pulse; another had been for general ill-health, visceroptosis, a very recent bereavement and a consequent desire to join her husband in India immediately. These cases represented the class of patients about which the most difficult questions arose.

The induction of premature labour was quite a different problem. Apart from the toxæmias of pregnancy, the medical indications were not at all common. The principle in cases of later pregnancy complicated by disease was to treat the disease and neglect the pregnancy. This applied especially to pneumonia, in which the extra strain of an induced labour was very undesirable. Finally, so long as the physician were honestly intent on the welfare of his patient and believed that she would benefit by the operation, he could not possibly exclude extra medical considerations from turning the scale in doubtful cases where a medical indication existed.

The Cardiological Aspect.

Dr. B. T. PARSONS-SMITH emphasised the very serious consequences which pregnancy imposed upon patients suffering from structural heart disease. Even under the most favourable conditions an additional strain was inevitable. The blood volume was increased; diaphragmatic excursion was especially restricted, limiting the functions of the thoracic viscera, and metabolic changes took place as a result of impaired endocrine balance. It might be concluded that, by causing these additional stresses, pregnancy would further deplenish the circulatory reserve and favour decompensation. Management of the patient was a very serious problem; the physician must satisfy himself as far as possible whether the cardiac reserve was likely to be equal to the additional strain, or whether compensation might be failing or already exhausted. Either of these events might necessitate the termination of pregnancy. Circulatory failure was, however, an extremely variable quantity. In its minor forms it need not obviate the successful conduct of pregnancy, but when well developed it might be an indication to terminate. Statistics covering 15 years' experience at Queen Charlotte's Hospital showed that, out of 196 cardiac cases, 49, or 25 per cent., had had their pregnancies artificially terminated. Abortion had been induced in five cases (2·5 per cent.); premature labour had been induced in 34 cases (17·5 per cent.); Cæsarean section had been performed at term in 10 cases (5 per cent.). Of the remaining 147 patients, 119, or 60 per cent., had gone on to normal labour at term, although all of these had had gross structural disease with some failure of compensation. Thirteen had had a spontaneous premature labour after the twenty-eighth week; three had aborted spontaneously, and 12 had died undelivered. Excluding these, the death-roll was two (40 per cent.) after induction of abortion, seven (20 per cent.) after induction of premature labour, one after Cæsarean section at term, three after spontaneous premature labour, and seven after spontaneous delivery at term. The high mortality-rate after artificial abortion was significant.

One of the most important clinical factors for assessment was the myocardial degeneration and the

degree of its compensation. From the point of view of congestive heart failure the indications were persistent tachycardia (120 or over); cardiac dilatation; diminished tone of the first heart sound and gallop rhythm. All these were very serious. Then there was the pulse of 120 or over at rest, and the irregular action typical of auricular fibrillation; venous stasis; venous engorgement; œdema; pulmonary, renal, and gastro-intestinal engorgement; a respiration of 20 or over; orthopnœa; attacks of cardiac asthma, and pulmonary œdema. Whether these were primary or the outcome of valvular disease or myocarditis, their development during pregnancy might be a sufficient indication for its termination unless they responded promptly to treatment. Even if compensation were restored, induction might ultimately be necessary, and in the presence of gross cardiac failure it entailed grave risks. Other possible indications were various forms of valvular lesion, hastening decompensation; mitral stenosis, and aortic incompetence. There was little to choose between the gravity of these two conditions; myocardial reserve was the deciding factor, but when they were combined the risk was far greater. Hence the importance in all doubtful cases of an electrocardiogram to determine the presence of defective muscle function and to differentiate between the various forms of arrhythmia which might coexist. Auricular fibrillation was of outstanding importance in most women of child-bearing age; it represented the mitral late stage of chronic rheumatic carditis, and was a disastrous complication which necessitated induction. According to Dr. G. H. Hunt, 40 per cent. of these cases died during pregnancy, and 50 per cent. suffered from decompensation. In his group of mitral stenosis cases without enlargement there were no deaths, and only 3 per cent. developed failure during pregnancy. In the group with enlargement there were 12 per cent. of deaths and 27 per cent. developed decompensation phenomena. Signs of arrhythmia and premature contractions might generally be disregarded entirely; paroxysmal tachycardia and auricular flutter were important only in so far as they failed to respond to adequate treatment. Heart-block might be associated with serious defects in the myocardium but, if uncomplicated, its effects on the circulatory function in pregnancy were likely to be minimal. Three cases of partial and one of complete heart-block had progressed successfully to normal labour. The physician should assume that the majority of cardiac patients would develop some degree of failure during pregnancy and that suitable antenatal care would enable most of them to maintain adequate compensation. In a few cases, however, heart failure might be so grave and refractory as to threaten health and life.

Dr. BERNARD HART then read the paper which appears on p. 658 of our present issue.

Pulmonary Tuberculosis.

Dr. GEOFFREY MARSHALL described his experience with a group of pregnant women suffering from active pulmonary tuberculosis. It had been very difficult to decide in any given case whether the indication was positive or doubtful. In the first place, it was impossible to group the cases according to the amount or extent of lung tissue involved. Roughly, where the patient had been known to suffer from definite symptoms of pulmonary tuberculosis for a great many years, in spite of the fact that the lesion might be fairly extensive, she might be expected to complete her pregnancy and labour without coming to great harm. Where, however, the disease was recent, one might expect the most tragic degeneration of condition; patients with short histories should therefore have pregnancy terminated. Patients with pulmonary tuberculosis reacted badly to any kind of surgical intervention, having prolonged pyrexia and in most cases showing signs of extension of the disease. On the whole they suffered less harm if they were allowed to go on to the fourth month and then had the uterus emptied by abdominal section.

Discussion.

Dr. ANTHONY FEILING remarked that patients with Graves's disease did not often conceive, but of those who did, Dr. Gardiner-Hill had found that very many stood their pregnancy extremely well. The indication for abortion in nephritis depended on the severity of the condition; not every case of acute and chronic nephritis need have abortion induced. Patients with true myxœdema practically never conceived, and there was no need to terminate pregnancy for the milder degrees of thyroid insufficiency. There must be very few cases indeed where it would be justifiable to cause abortion on account of epilepsy in the parents; only 30 per cent. of epileptics had an epileptic heredity. He asked how Dr. Hart distinguished between women who threatened suicide without intending to carry it out, and those who were really likely to fulfil their threat.

Dr. H. B. DODWELL mentioned three young married women who never passed a winter without severe paroxysmal asthma, producing considerable strain on the heart and a condition quite grave enough without the additional strain of pregnancy. He also knew one epileptic woman whose attacks would almost certainly constitute grave risk to her child if she bore one. She had had one baby whose life had been endangered many times in the first two months.

Mr. T. C. CLARE advocated sterilisation of women whose pregnancies were interrupted for medical reasons. A pregnant unmarried woman who had consulted him had not asked him to terminate pregnancy, but had been worried because she had only one kidney. She had also had a slight degree of pyelitis. Was abortion justified?

The CHAIRMAN mentioned severe chorea as a possible indication for abortion. He did not agree that induction was necessary for myxœdema; the myxœdema of women who became pregnant was said either to be very slight or to be curable with thyroid. The amount of thyroid required to keep the patient in fair condition was immaterial. Phthisis was said to flare up acutely after natural delivery; did it do so after induction?

Replies.

Mr. EARDLEY HOLLAND agreed that there was no strict necessity to induce abortion for myxœdema, but nowadays it was usual to give the patient the benefit of the doubt. Epilepsy in the father did not constitute an indication from the purely medical point of view. He had had to do Cæsarean section under spinal anæsthesia because of acute dyspnœa at the end of pregnancy in a case of Graves's disease and in one of simple goitre. It was wonderful how cardiac cases bore pregnancy if kept in bed; he allowed them to go to term and on the tenth day sterilised them by excising a loop of the Fallopian tube under local anæsthesia. The operation was trivial and took about 12 minutes. It was said that the placenta swarmed with tubercle bacilli, both after labour and induction, and thus constituted a focus of infection, and that therefore labour should be terminated by hysterectomy. Pyelitis in a single kidney was certainly an indication for abortion.

Dr. PARSONS-SMITH said that the artificial termination of pregnancy was less often justified in primiparæ than in multiparæ.

Dr. BERNARD HART agreed that it was extremely difficult to decide which threats of suicide were to be taken seriously; he had no hesitation in giving the benefit of the doubt. It depended partly on the history and partly on the precise clinical picture, particularly such things as interference with sleep and impairment of the bodily condition, which made the risk very serious.

EXTENSION OF BURTON-ON-TRENT INFIRMARY.—Property adjoining this hospital has been purchased for the erection of extensions. The new buildings will include new X ray, artificial sunlight, and ear, nose and throat departments, a lecture room, and a recreation room for nurses.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

AT a meeting of this Section held on Jan. 25th Sir WILLIAM SMYLY took the chair in the absence of the President, and there was a discussion on

Radium Treatment of Uterine Carcinoma.

Dr. BETHEL SOLOMONS showed a uterus which he had removed by the Wertheim method.

The woman was a multipara of 57. Her regular menstruation ceased for four years, but a year ago she started to bleed irregularly. On examination a typical squamous cancer of the cervix was found; it bled easily on examination, and seemed to be fixed to all the fornices. It was a borderline but somewhat dangerous operative risk. Radium was inserted and the patient was closely watched for four months. Gradually the appearance became nearly normal, but as she had two hæmorrhages during that time, Dr. Solomons decided to remove the uterus.

A microscopic report from Dr. F. P. J. Burke stated that "the glands show no abnormality, there is no evidence of malignancy, and the muscle walls show a good deal of hyaline change." There was no excessive fibrous tissue during the operation, but the left ureter was slightly out of its usual position. Recovery was uneventful.

Dr. W. C. STEVENSON, who had given the radium treatment, said that the dose in this case was rather larger than usual, because he had given it in more than one place. He had begun treatment on Oct. 2nd and continued it for 72 hours. On the fourth day the patient had taken some meat extract, after which she developed severe diarrhœa. Dr. Stevenson has used 49 millicuries of radium, and the one place he had been afraid of was the rectum, so he had kept the radium as far away from it as possible. The cavity of the uterus was 7 cm. long, and the radium tube was left for 24 hours, and was then pulled down a further 2 cm. and left for another 24 hours; at this time it was just at the cervix.

Dr. W. A. TAYLOR said that the sequence of events described in text-books had not occurred in this case. The stage of hyperæmia had developed when the patient had suffered from diarrhœa, but there had apparently been no stage of sloughing, as nothing in the nature of a slough had come away. After the diarrhœa ceased the condition of the cervix very rapidly improved; in fact, it appeared to be healed. At the present time cases of carcinoma of the cervix were divided in the literature into operable, borderline, and non-operable, cases. He personally thought that radium removed the borderline cases, as all surgeons now decided to see what radium would do for these cases before operating. The question of giving this patient a further course of radium had been considered, but she had passed from a condition of parametric involvement to one in which no parametric involvement could be found, and so it appeared that the time for operation had come.

Dr. D. G. MADILL said that in this case he would have removed the uterus. He asked how many needles had been used, and where they had been inserted.

Dr. A. H. DAVIDSON asked if Dr. Solomons had experienced any difficulty in carrying out the operation, as it was generally supposed that after radium treatment a lot of fibrous tissue formed which made the carrying out of a Wertheim operation difficult. He thought it possible that the hæmorrhages were fibrotic, and wondered whether the radium treatment would not have been sufficient, and whether the operation was necessary or beneficial. Radium got mostly at the nearer cancer cells and not at the further ones, but if in this case it had reached the further cells and killed them, then operation would not have been necessary.

Dr. R. STUMPF said that there were three ways of treating cases like the one described by Dr. Solomons —radium, deep X ray therapy, or combined treatment by X rays and radium. According to recent statistics, the results of each of these treatments were about the same, and it had been stated that the results of radiotherapy in operable cases were practically the same as those of operation. In borderline cases cure by radiotherapy could be obtained in from about 10 to 15 per cent. Considering that operative technique in these cases could hardly be improved, and that radiotherapy was only in the early stages, he thought it likely that the time might come when operation even in operable cases would be abolished, and all cases would be treated by radium.

After further discussion Dr. STEVENSON said it was sometimes difficult to know how long to wait after radium treatment before operating. In the present case the treatment had been very severe, and the operation had been performed nine and a half weeks afterwards, and he thought that this was about the right time to wait. He had not used needles at all, but had used the screen method by which it was possible to give a much more diffuse dose, and one which was more likely to effect the parametrium.

Dr. J. S. QUIN read a paper on

Scopolamine-morphine Narcosis in Labour.

He considered it important that the first injection should be given to the patient as soon as labour had started and a further injection after the child was born. In 25 per cent. of the patients treated he had found that the result was "very good," in 15 per cent. the result was good, and in 10 per cent. there was no apparent benefit from the treatment.

Dr. MADILL said it had been stated that after the judicious use of scopolamine-morphine the patient would pass into a somnolent state and would go into labour, and that labour would pass over without the patient remembering much, if anything, about it. His experience was that scopolamine-morphine had not been as successful as this. He noticed that Dr. Quin, out of 61 cases, only regarded 15 as complete successes. Failure was sometimes attributable to want of complete silence in the patient's surroundings. In his opinion scopolamine-morphine was not the ideal anæsthetic in obstetrics. He thought that rectal ether had great possibilities.

Dr. SOLOMONS said he did not advocate twilight sleep as a general measure, but thought it should certainly be given to the primigravida who dreaded childbirth, and the multipara who had had a bad time on her first confinement, and who looked forward with fear to the second. There was no doubt that the method was not ideal, and that babies were often born "blue." The room should never be darkened, for it was necessary that the nurse should have a good view of the patient. He thought a great deal of harm had been done by advocacy of the method in the lay press, and by the establishment of "twilight sleep homes" in charge of doctors who were not always specialists in obstetrics.

Dr. F. W. DOYLE referred to a gas-oxygen apparatus which had recently been installed at the Coombe Hospital, and said that this method was now being used in America, apparently with excellent results. Gas-oxygen could be given with perfect safety to both mother and child, and did not interfere at all with the progress of labour; ; in fact, it was claimed that it accelerated rather than retarded its progress; nor did it interfere with lactation.

Dr. A. H. DAVIDSON thought that the great disadvantage of scopolamine-morphine narcosis was the supervision required. It would not be easy for a busy obstetrician to visit a patient every three hours, but if the nurse could be sufficiently trained to give the injection and to see that the patient did not come to any harm from it, it would be a different matter.

The CHAIRMAN, referring to the rules laid down for the beginning of scopolamine-morphine injections, said that he thought when labour became painful

was the right time to begin the injection, without any physical examination. The treatment seemed to him to be one which would be confined to the first stage of labour. Most patients in private practice insisted on getting some kind of injection. Scopolamine-morphine was certainly not ideal, but he had found that it eased patients and helped them greatly in the first stage. Its great drawback was the uncertainty of the result. Many cases in which it appeared to be absolutely useless turned out to be the best.

Dr. D. J. CANNON showed a specimen of Chronic Metritis, and a discussion followed.

Reviews and Notices of Books.

ŒSOPHAGEAL OBSTRUCTION.

Its Pathology, Diagnosis, and Treatment. By A. LAWRENCE ABEL, M.S., F.R.C.S., Assistant Surgeon, Cancer Hospital; Surgeon, London Lock Hospitals. London: Humphrey Milford, Oxford Medical Publications. 1929. With 132 illustrations and 2 coloured plates. Pp. 245. 30*s*.

THE surgery of the œsophagus teems with many problems which are not capable of solution by ordinary surgical methods. The practitioner in this department of surgery must have special training in methods of investigation as well as be alive to the factors which render the application of surgical principles suitable to other parts of the body of little use in this region. The author of this book seems to be well equipped in both these respects. He gives a good account of all forms of œsophageal obstruction, prefacing the main substance of his thesis by two chapters on anatomy and what has of recent years been referred to as pathological physiology. It is interesting to note that Mr. Abel finds he can perform the very unpleasant examination with the œsophagoscope in the vast majority of cases without any anæsthetic, local or general. Whether he can do this without a preliminary education to tolerance by the passage of bougies is not stated. Less expert clinicians usually find that at least local anæsthesia is necessary in a previously untreated patient.

An important section is that on cancer of the œsophagus. Unlike some workers in this field, Mr. Abel believes that the disease gives signs of its existence early and that it remains localised long after its presence can be diagnosed. He states that glandular metastases are the exception rather than the rule, and believes that surgical removal will ultimately become a feasible operation with a risk not too great. Just how the extreme difficulties of access, suture, avoidance of infection, and shock are likely to be overcome he gives no hint; but the possibility that some progressive step in the raising of immunity before operation may change the whole aspect of the problem must not be lost sight of. Indeed, if treatment by some other method has not displaced the excision of malignant disease this may confidently be anticipated. A fair summary of work which has been done with radium is given by Mr. Abel, who seems to think that there is a certain field also for diathermy treatment.

All surgeons interested in disease of the œsophagus should read this book. There are good and useful bibliographies appended to each chapter. Numerous explanatory illustrations, including radiograms and some coloured œsophagoscopic appearances, add greatly to its value.

SURGICAL DIAGNOSIS.

Handbook of Surgical Diagnosis, By CLEMENT E. SHATTOCK, M.D., M.S. Lond., F.R.C.S., Surgeon to the Royal Free Hospital; Assistant Surgeon to the Cancer Hospital. Edinburgh: E. and S. Livingstone. 1929. Pp. 678. 15*s*.

THIS handbook systematically describes the appearances, symptoms, and differential diagnostic points of the various surgical conditions. The book is arranged on a regional plan, so that all forms of peritonitis, for instance, are considered together however different their symptoms. Internal hernia, which comes to the surgeon usually under the guise of acute obstruction, is grouped, because of its name presumably, with ordinary inguinal or femoral herniæ which present themselves as tumours in the groin. It would possibly have been better if the author could have grouped his subject matter according to the most prominent symptom, but, since Mr. Shattock has had considerable teaching experience, the arrangement is doubtless founded on the plan which he has found to be the most helpful line of approach to clinical diagnosis. There are numerous skiagrams but no other illustrations. The information set out in the handbook is reliable and the student will doubtless derive considerable help from its pages.

Elements of Surgical Diagnosis. By Sir ALFRED PEARCE GOULD, K.C.V.O., C.B.E., M.S., F.R.C.S., late Surgeon to the Middlesex Hospital. Seventh edition, revised by ERIC PEARCE GOULD, D.M., M.Ch. Oxf., F.R.C.S. Eng., Surgeon to Out-patients at the Middlesex Hospital. London: Cassell and Co., Ltd. 1928. Pp. 730. 12*s*. 6*d*.

THIS small volume on surgical diagnosis needs no introduction since it has been a popular student's manual for many years. It was first published in 1884 and the original form is still retained, a striking feature being the separation of the diagnosis of injuries from the diagnosis of diseases. It is six years since the last edition was published, and Mr. Eric Pearce Gould, who has revised several editions, has made some alterations and additions in the present volume. An introduction dealing with the methods of surgical diagnosis has been substituted for the first three chapters of previous editions; cholecystography and the use of lipiodol are mentioned for the first time; and many new X ray plates have been added. The seventh edition fully maintains the high standard of its predecessors.

NELSON LOOSE-LEAF LIVING SURGERY.

Edited by ALLEN O. WHIPPLE, M.D., and FORDYCE ST. JOHN, M.D. Vol. VII.: Gynæcology and Surgical Obstetrics. Supervising Editor: ARTHUR H. CURTIS, M.D. New York: Thomas Nelson and Sons; London: Waverley Book Co., Ltd. 1929. Pp. 729.

Vol. VII. completes this new system of surgery and is well up to the standard set by previous parts. The subject matter is divided up into 37 sections, written by 23 different authors. Neither normal nor abnormal labour is considered and the only obstetrical subjects other than those sequelæ of childbirth always included in gynæcological text-books are puerperal fever and Cæsarean section. A long informative and satisfactory chapter is devoted to the endocrine aspects of gynæcology; this includes accounts of the modern work on the ovarian hormone, and an interesting section on the pathology and physiology of the endometrium. When whole chapters can be assigned to conditions such as leucorrhœa and dyspareunia, which by the way is discussed with a frankness unusual in technical works, it seems unfortunate that space has not also been given to the consideration of dysmenorrhœa which the practitioner is constantly called upon to treat. A particularly good chapter is that on puerperal fever; the principles of its pathology and the basis of treatment are well set out. The causes and treatment of lumbosacral and sacral backache are clearly described, also that interesting condition known as endometriosis.

Of those gynæcological affections for which radiotherapy has been employed, Dr. Curtis himself deals

with cancer of the uterus and myomata. He believes radium to have only a limited field of usefulness for destroying myomata and clearly states the indications and contra-indications. In his view, surgical removal must still play the major part in treatment. In exsanguinated individuals he has found preliminary feeding with liver, sweetbreads, brains, kidney, or ox-heart to be of great advantage, but in urgent cases he relies on blood transfusion to produce a rapid increase in hæmoglobin content. High fundic amputation is recommended whenever possible; this is good advice. When he is discussing the treatment of carcinoma of the cervix, the author does not seem to have made up his mind definitely as to the scope for operation and radium application. He refuses to be dogmatic and leaves the reader to choose for himself from data, which are really insufficient to afford guidance. He attributes to R. E. Fricke a statement that X rays alone have not cured a single case of cervical cancer in America.

Previous volumes of this system have been favourably reviewed in our columns. Now that the work has been completed the editor-in-chief must be congratulated on an excellent production. The numerous contributors have been selected with discrimination; the outlook of the book is modern and the subject matter well presented. It provides a uniformly reliable description of the principles and practice of the surgical art. That the editor intends the reputation of the book to be maintained is clear from some additions which have already come to hand. If future advances in surgery are added as promptly as the recent ones now sent us, and the supply is kept up, the practitioner who possesses this attractive work will be kept well up to date in current surgical literature.

LIPIODOL.

Diagnostic et thérapeutique par le lipiodol. By Prof. J.-A. SICARD, Médecin de l'Hôpital Necker; and Dr. J. FORESTIER. Paris: Masson et Cie. 1928. Pp. 370. Fr.50.

Lipiodol in the Diagnosis of Thoracic Disease. By F. G. CHANDLER, M.D., F.R.C.P., Physician with charge of Out-patients, Charing Cross Hospital; Physician, City of London Hospital for Diseases of the Heart and Lungs; and W. BURTON WOOD, M.D., M.R.C.P., Physician with charge of Out-patients, City of London Hospital for Diseases of the Heart and Lungs. London: Humphrey Milford, Oxford University Press. 1928. Pp. 134. 10*s.* 6*d.*

To the radiologist and to many surgeons and physicians interested in special branches of medical science, the work by the late Prof. Sicard and Dr. Forestier should prove a valuable work of reference. It contains the most authoritative and detailed account available of the uses of lipiodol at the present day. Inspired by the discoverer of this valuable diagnostic procedure, the chapters are marked by precision and restraint, and the numerous photographs and diagrams facilitate practical application. The well-known uses of lipiodol in pulmonary diseases, in the exploration of the pathological anatomy of the central nervous system, and in the examination of the urinary tract are fully dealt with, and less widely known applications of the method for exploring the accessory sinuses, the stomach, and the female genital tract open out avenues of future development. The fact that 66 entire pages are devoted to the bibliography illustrates the comprehensive nature of this excellent book.

Those who are specially concerned with the use of lipiodol in the diagnosis of pulmonary disease will find the 30 pages which comprise the text of the book by Dr. F. G. Chandler and Dr. W. Burton Wood attractive. They are followed by 47 well-printed radiograms which amply illustrate the commoner diseases in which the method is useful. It is a work of this compact nature which will be welcomed by the busy practitioner who has no leisure to master a lengthy survey of a subject not yet of daily importance in his routine.

ROCKEFELLER INSTITUTE STUDIES.

Studies from the Rockefeller Institute for Medical Research. Reprints. Vol. LXV. New York: Rockefeller Institute. 1928. Pp. 617. $2.00.

THESE reprints of papers, originally published in various journals by those working in the Rockefeller Institute or receiving grants from it, are of great value to any reference library. The most recent volume contains 45 papers covering an exceedingly wide field of research in pathology, biophysics, physiology, chemistry, clinical medicine, and experimental surgery. There are included papers on heart-block, crystalline structure, bullous impetigo, allergy, the permeability of thin, dry membranes, experimental sarcoma, Oroya fever, reciprocal effects of concomitant infections, and pneumococcal meningitis.

Dr. Fred. W. Stewart contributes two papers on pneumococcal meningitis with special reference to pathological anatomy and therapy. Dr. Simon Flexner shows that the ætiology of epidemic encephalitis has not been clarified by experiments with herpes virus in guinea-pigs. Posthumous articles by Hideyo Noguchi on the ætiology of Carrion's disease and the relationship between Oroya fever and benign verruga are included and an important composite article on nuclein-induced leucopenia and its dependence on the spleen. There are two papers on the antigenic complex of *Streptococcus hæmolyticus*, and two broadly philosophical articles deal respectively with ontogeny and hereditary diseases. The only purely clinical studies are on cardiac irregularities, heart-block, and chicken-pox. The plates, diagrams, and bibliographical tables in the original papers are reproduced in full.

A CATALOGUE OF SCIENTIFIC BOOKS.

Early Books on Medicine, Natural Sciences, and Alchemy. L'Art Ancien S.A. Zurich: 8, Pelikanstr. Pp. 722. Swiss Fr.12.

THE value of a catalogue of second-hand books to a collector is twofold: in the first place the vendor may be ignorant of the worth of some of the rarer books which turn up at times and are bought in parcels of miscellaneous printed matter, and the keen-eyed collector may acquire a bargain for an old song. This does not often happen. In the second place a well collated catalogue, such as this one, contains a great deal of history for the bibliophile, and forms a handy book of reference. This catalogue consists of 1988 items, with illustrations of title pages and an index and contains a very representative lot of the incunabula of the profession. We miss one or two items; for instance, it does not include a copy of Auenbrugger's classic on percussion, nor are Edward Jenner's inquiry nor any of John Hunter's works included, and Americans will search in vain for Beaumont's account of Alexis St. Martin. The prices are given in Swiss francs and vary from Buchan's *Domestic Medicine* (1784) at 8 Swiss francs to Bartholomæus Anglicus (1491–92) at 12,500 Swiss francs, and Albukasim (1471) at 15,000. There are no fewer than 18 Paracelsus items, mainly from the Georg Kloss Library, and oddly enough a few of the books bear the book plate of the House of Commons Library. On the whole, the prices seem rather high. English buyers may be interested in Jebb's edition (1733) of Roger Bacon's *Opus Majus* at 275 Swiss francs, and Grosseteste's *Commentaria in Posteriora Aristotelis* (1497) at 650 Swiss francs. Sixty Swiss francs for the New Sydenham Society reproduction of William Hunter's *Gravid Uterus* seems to us a heavy price. Finally we note that Sir Richard Manningham, a distinguished obstetrician, is entered as physician to the Royal Society.

TROPICAL DISEASES.

Manson's Tropical Diseases. A Manual of the Diseases of Warm Climates. Ninth edition. Edited by PHILIP H. MANSON-BAHR, D.S.O., M.A., M.D., F.R.C.P. London: Cassell and Co., Ltd. 1929. Pp. 921. 31*s.* 6*d.*

THE ninth edition of this manual of the diseases of warm climates follows the eighth within a period of four years, and in the interval the book has been reprinted once. The author remarks that in no other department of medicine have advances, both in diagnosis and in treatment, been so many or so striking as in the practice of medicine in the tropics, and the volume has been revised so as to take cognisance of the newest work on malaria, kala-azar, dysentery, and sprue. In spite of this successful attempt to keep the manual fully up to date, it remains a consistent whole and has not grown unduly in bulk; the result has been attained by judicious arrangement of type and by the free use of diagrams and illustrations, which in the present edition include 35 plates (23 of them in colour), 401 figures in the text, 6 maps, and 34 charts. The volume is indispensable for any who wish to acquire or retain an adequate knowledge of disease in all parts of the British Commonwealth. Tropical medicine is under no little debt to the author for the unremitting industry and vigilance which its compilation has entailed.

Die Malaria in ihrer Bedeutung für die Geschichte Roms und der Römischen Campagna. (Malaria in Relation to the History of Rome and the Roman Campagna.) A Historical Study. By the late ANGELO CELLI. Translated and edited by ANNA CELLI-FRAENTZEL. With an introduction by Prof. Dr. HENRY E. SIGERIST. Leipzig: Georg Thieme. 1929. Pp. 118. M.12.

THIS work is the outcome of Angelo Celli's investigations into malaria in the Roman Campagna, prepared for the first International Malaria Congress in Rome, and its posthumous publication has been made possible by the good offices of his various friends and admirers. It is an abridged edition of the original account which has been translated into German by his widow, Anna Celli-Fraentzel. Celli, as all the world knows, was one of the pioneers in the war against malaria, and his work in the Campagna produced the most brilliant practical results. Not only has malaria disappeared, but the antimalaria measures have resulted in the bonification of the agricultural land.

The subject matter of the volume consists of a review of the political and sanitary state of the Campagna in historical times, with an account of the methods inaugurated by Celli. The text is liberally annotated with references which occupy some 30 pages and will remain a monumental memory of one of the first and greatest practical Italian public health workers in this field.

Malaria Problems. By FREDERICK L. HOFFMAN, LL.D., Consulting Statistician, Prudential Insurance Company; Member, National Malaria Committee. 1928. Pp. 207.

ONLY those familiar with the subject can clearly realise the enormous economic consequences of malaria, in view of the fact that the mortality index is but a slight indication of the prevalence of the disease. On the basis of an assumed fatality rate of 1·5 per cent., there would be approximately 1,035,000 cases of malaria throughout the entire country during the course of a year. This small volume contains a number of reprinted papers on the malaria problem and represents many years of attention on the part of the author to a question of first-rate importance to large sections of the community. From 1916 onwards he has been organising an attempt to deal with the whole problem along more rational lines than have been followed in the past. From this has sprung the National Malaria Committee which has held sessions annually in conjunction with the meetings of the Southern Medical Association.

The greater number of the incorporated papers deal with the organisation of the Committee and the results which have already been achieved.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES, Vol. XXVI., January–March.—Prof. F. S. Langmead contributes a paper on Some Disorders of Neuro-muscular Coördination in Children, in which he includes cardiospasm, Hirschsprung's disease, anal spasm without any local cause, congenital hypertrophy and dilatation of the bladder and ureters, and idiopathic hydronephrosis, and congenital pyloric spasm and pyloric hypertrophy.—In his paper on the Illness of Infection in Measles, Dr. G. F. Abercrombie reports personal cases of this rare condition, in which a child exposed to the infection of measles a few hours earlier shows physical signs such as slight rise of temperature, sneezing, conjunctival injection and even a morbilliform rash which disappear in a day or two but are followed by undoubted measles within the incubation period. Dr. Abercrombie maintains that the illness of infection in measles is much less rare than is usually supposed, but its signs and symptoms may be so transient and trivial as commonly to escape observation.—Dr. Hilda N. Stoessiger contributes a Note on Summer Diarrhœa, in which the methods of feeding in a number of recent cases of summer diarrhœa and vomiting in young breast-fed or bottle-fed infants are compared with those of a random single group of infants of similar age. No greater proportional incidence of infective diarrhœa could be demonstrated among infants fed on cow's milk than among those fed on dried or condensed milk. It is suggested that the maintenance of a cheap and clean fresh milk-supply will prove to be a safer way of preventing infective gastro-enteritis than the replacement of fresh milk indiscriminately by dried or condensed milk.—Dr. Leslie Cole records a Case of Tetanus Simulating Tetany. The patient was a male child, aged 2 years and 9 months, in whom the possibility of tetany was suggested by the nature of the spasms involving the limb muscles. The diagnosis of tetanus, however, was established by the short and fatal course, the complete absence of rickets or other spasmophilic manifestations, and the failure to respond to calcium chloride, hydrochloric acid, or parathyroid gland. Infection with tetanus had probably taken place through a perforated ear-drum.—Dr. A. Moncrieff and Dr. R. E. Steen describe a Case of Early Cirrhosis of the Liver. The patient was a boy, aged 9 years, in whom cholecystotomy was performed for jaundice which had lasted six weeks. Examination of a small piece of liver removed at the operation showed early fibrotic changes, microphotographs of which are reproduced. Recovery took place.—The abstracts from current literature are devoted to tuberculosis.

AMERICAN REVIEW OF TUBERCULOSIS, December, 1928.—I. D. Bronfin and Saling Simon, writing on cardiac lesions complicating pulmonary tuberculosis, contravert the opinion that cardiovascular disease with passive congestion of the lung is preventive of tuberculosis. There is a wide discrepancy between the figures given for the incidence of valvular disease in pulmonary tuberculosis ranging from 1·2 per cent. (Anders) to 15 per cent. (Burns). The authors found clinical evidence of valvular disease in 6 per cent. Artificial pneumothorax treatment should be administered very cautiously in these cases and discontinued as soon as there is any evidence of cardiac disturbance.—Benjamin Goldberg, Henry C. Sweany, and Robert W. Brown have studied the gross and microscopic changes found in the bowels of 230 patients who had died from advanced pulmonary tuberculosis, ulcerative enteritis being found in 80 per cent. In one case a continuous chain of ulcers was found

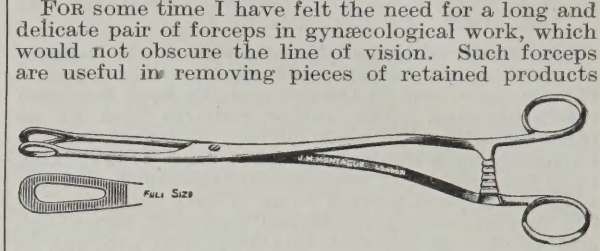
extending from the stomach to the rectum. Œsophageal fistula may result from the rupture of caseous hilar glands, and this was noted in two instances. Healing had resulted in a diverticulum in one case, in the other a permanent opening into a cavity in the broken-down gland was found. Intestinal perforations are relatively uncommon. A large number of lesions of the gastro-intestinal tract heal, as was evident in a few instances in which accidental death enabled an examination to be made. Ulcers of lymph follicles and submucosal tissue may heal without scar, those of deeper tissues lead to contractions and the formation of diverticula. Severe symptoms may result from slight lesions, while slight symptoms may be associated with grave ulceration. Incipient lesions are most frequently found in the lymphoid tissue about the ileocæcal valve.—W. B. Kendall and C. B. Ross survey the results of artificial pneumothorax after 14 years. The difficulty of securing proper "controls" for an investigation of this kind is obvious. Ideal controls to use in estimating results would be comparable patients who had refused similar treatment, but nowadays very few refuse to accept this form of therapy. Patients in whom collapse therapy has failed on account of adhesions, for example, have been used for comparison. Of the most recent group of cases (A.P. initiated 1923–1927) 66·9 per cent. of those who received compression are improved, well, or working, compared with 31·8 per cent. in the similar "uncompressed" group, the figures for patients able to work being 22·2 and 6·8 per cent. respectively. At the end of ten years 65·7 per cent. of those who had received treatment (complete or partial but fairly satisfactory collapse) were dead, while 92·5 per cent. of the control group were dead. The results achieved are still more striking if comparison be made between the patients in whom complete collapse was obtained and those in whom adhesions allowing a partial but preventing a complete collapse were present. The improvements which result from a partial collapse are usually only temporary. At the end of five years the difference between the total improvement shown by this type of compression and that of the controls has diminished to less than 10 per cent. A wider use of such surgical methods as phrenicotomy and thoracoplasty is therefore suggested.—A paper by McKahn and J. C. Torrey on the Development of Tubercle Bacilli is noticed on p. 696.

INDIAN JOURNAL OF MEDICAL RESEARCH. January, 1929.—The first paper in the present number is an elaborate epidemiological study of small-pox by A. J. H. Russell and E. R. Sundararajan. M. O. T. Iyengar contributes a comparative study of the larvæ of *Anopheles fuliginosus*, *pallidus*, and *philippinensis*. —R. Knowles and B. M. Das Gupta provide studies on the tricercomonas of the pig and a trichomonas of the porcupine.—Menon T. Bhaskara describes pathological changes in chronic appendicitis, A. N. Bose and B. N. Banerji the causes of ascites, P. A. Maplestone a simple method of preserving fæces containing hookworm eggs, and a redescription of *Wuchereria bancrofti*.—J. M. Henderson, N. K. De, and S. Ghosh contribute some hæmatological and serological investigations in leprosy.—V. T. Korke continues his observations on filariasis in some areas of British India, J. A. Sinton on Indian species of the genus phlebotomus, and together with W. Bird his studies in malaria with special reference to treatment.—J. Taylor and U. Thant have made observations on the vitamin B deficiency in pigeons; R. N. Chopra and his co-workers describe some medicinal plants from the Himalayas and the action of ephedrine and pseudoephedrine on the heart.—T. C. McCombie Young and Abdul Majid continue their observations on malaria in Coorg, and F. P. Mackie and N. Hamilton Fairley their studies on sprue, which comprise three important papers on the morbid anatomy, the blood changes, and the microscopical changes in the organs after death.

New Inventions.

A MODIFIED SPONGE-HOLDING FORCEPS.

FOR some time I have felt the need for a long and delicate pair of forceps in gynæcological work, which would not obscure the line of vision. Such forceps are useful in removing pieces of retained products

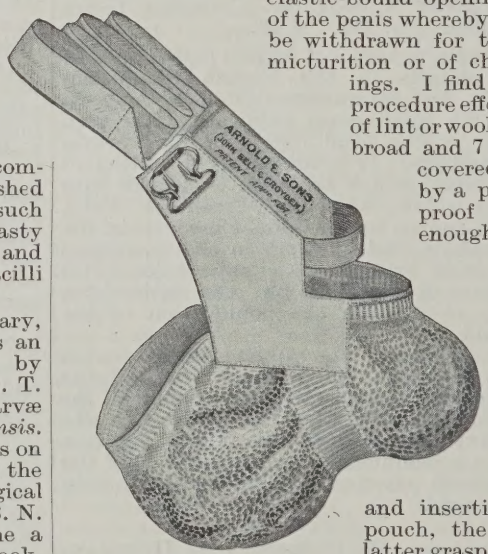


and polypi from the cervical canal, whereas similar forceps of larger size are apt to cause damage to the mucous membrane. I have therefore had made the forceps here illustrated. They can also be used with a piece of gauze for swabbing out the cavity of the uterus in suitable cases. Messrs. J. H. Montague, 69, New Bond-street, London, W., are the manufacturers.

REMINGTON HOBBS, M.D.

A NEW SUSPENSORY BANDAGE.

IN the treatment of gonorrhœa in the male I have found the suspensory bandage herewith illustrated appreciated by patients as a comfortable, convenient, and cleanly means of holding dressings in position. The bandage has a separate pouch for the penis in addition to the usual support for the testicles. This pouch is suspended from the pubic attachment of the bandage and is provided with an adequate elastic-bound opening at the root of the penis whereby the latter can be withdrawn for the purpose of micturition or of changing dressings. I find the following procedure effective. A piece of lint or wool about 5 inches broad and 7 inches long is covered externally by a piece of waterproof tissue large enough to overlap by nearly an inch all round and the double layer folded lengthwise over the penis. On turning the edges inwards over the dorsum and inserting within the pouch, the walls of the latter grasp the enveloped organ sufficiently firmly to give a comfortable feeling of support and to prevent displacement of the coverings. During withdrawal the penis is kept fully covered until clear of the pouch. The advantages of the bandage are: (1) Micturition and redressing can be performed by the patient without his having to undo any tapes and with no more exposure of the parts than would be required in normal circumstances. (2) Dressings are held securely in position day and night and can be changed without risk of soiling the fingers. (3) The support given to the penis adds to the patient's comfort in the acute stage and may help to prevent the development of epididymitis. (4) The isolation of the infective area within the bandage gives an effect of tidiness that assists the patient mentally. The bandage is manufactured by Messrs. Arnold and Sons (John Bell and Croyden), 50–52, Wigmore-street, London, W. 1.



A. GARDNER, M.B., Ch.B. Glasg.

THE LANCET.

LONDON: SATURDAY, MARCH 30, 1929.

A SANATORIUM COLONY.

THE National Association for the Prevention of Tuberculosis is about to make an interesting experiment at Burrow Hill. The well-known sanatorium owned by the society is being converted into one conducted on colony lines "for youths suffering from pulmonary tuberculosis in whom permanent arrest of the disease is ultimately likely to be secured." The age-limits are fixed at 14 and 19 years, and thus the whole of the adolescent period is included. Training in clerical work and gardening is to form an integral part of the scheme. The result of the experiment will be awaited with interest, but much of its value will be lost unless clear instruction is given to guide tuberculosis officers and others in the selection of cases. In the past lax diagnosis has too often obscured the results of sanatorium treatment. If a high proportion of the cases are non-tuberculous or doubtfully tuberculous—a state of affairs usually found in children's sanatoriums—the experiment will fail to answer the question whether a sanatorium colony for boys can enable the tuberculous adolescent to obtain permanent arrest of disease and fit him to compete in the open market when his training is over. Such is the ideal that the Association desires to attain.

Cases of pulmonary tuberculosis in adolescence may be classified in four groups: pre-adolescent phthisis; pulmonary tuberculosis of juvenile type ("primary infection" group); cases of pleurisy with effusion; and adolescent phthisis. (1) The pre-adolescent group will consist of the few survivors among children suffering from the adult type of infection who have reached the age of 14 years. There need be no doubt about the diagnosis, for besides the evidence supplied by physical signs and radiograms, tubercle bacilli can always be demonstrated in sputum or stools. The prognosis in such cases is hopeless and colonisation is obviously out of the question for these tragic cases. (2) The primary infection group consists of those boys whose history or physical signs suggest a latent infection, such a diagnosis being supported by radiographic evidence. Calcified nodes in the lung fields and calcified hilar glands are, however, evidences of healed tubercle and are usually seen in radiograms of the chests of healthy children. Before calcification has occurred radiograms afford no evidence of infection, physical signs are notoriously unreliable, and a diagnosis which depends upon guess-work does not justify sanatorium treatment. When a radiogram shows widespread nodes or definitely enlarged calcified glands sanatorium treatment may be indicated, especially if the patient is poorly nourished or subject to cough. But in general calcifications suggest acquired immunity rather than any special susceptibility to further attack from either endogenous or exogenous sources. (3) Pleurisy with effusion may be either demonstrably tuberculous, tubercle bacilli being found in the fluid, or a tuberculous origin may be diagnosed with reasonable certainty by a process of exclusion. (4) It would be well if the term "consumption" were limited to cases of adolescent and young adult phthisis. The gravity of the prognosis of this condition would then be recognised more clearly. The finding of the tubercle bacillus in the sputum of an adolescent who belongs to the industrial class is almost a sentence of death. Even if tuberculosis is discovered at a stage when the disease is localised, and the best modern methods of treatment are wisely applied, death within a very few years is probable. It is necessary to insist upon this melancholy fact Those who subscribe to schemes for the educational training of the young consumptive should realise that the large majority of the pupils may not survive to follow a career. This may be said without prejudice to the beneficial effects of occupational therapy. Idleness is most detrimental to the mental and physical interests of sufferers from a chronic disease. Further, a few of the stricken will survive and of these few most will be fit to follow some quiet occupation.

The Burrow Hill Sanatorium Colony is to provide beds for 60 "arrested cases" and 20 for patients "in the earlier stages of the disease." As the colony is intended to meet the needs of the whole country there should be no difficulty in finding suitable candidates. The patient with arrested disease is presumably one who has already spent one or two years in a sanatorium. Unfortunately experience has shown that the adolescent male consumptive as a rule prefers a death whose imminence he cannot realise to confinement in an institution. For those who have already "made good" in a sanatorium and possess the necessary determination the colony should provide an admirable school. It is unfortunate, however, that reference is made in the prospectus to "the earlier stages of the disease." The old teaching that tubercle commences as a limited focus at the lung apex and progresses by extension from apex to base can no longer be maintained. We now know that the onset of pulmonary tuberculosis in the young adult is usually an acute process, associated with an infiltration situated below the clavicle and that within a few weeks of the onset of the first symptoms of the disease there may be widespread involvement of the lung. The "early case" of the "T.B. minus" group—that refuge of the diffident tuberculosis officer—does not require sanatorium treatment. One who is usually already the subject of a depressed mentality and debilitated constitution should not be sent to live in the company of those who are suffering from a malady always dangerous and often fatal.

THE UNITY OF THE PERSON.

IN the latter part of the nineteenth century the advances in sciences ancillary to medicine placed pathology upon a sound observational basis, and it seemed reasonable to expect that bodily processes in health and disease could be fully expressed in terms of chemistry and physics. Bacteriological discoveries came into line with this expectation, for the reactions between parasite and host were found to depend upon the production of substances whose behaviour, even if their composition resisted analysis, could be summed up in chemico-physical language. Certainly there was in the background a vague theory of vitalism, which postulated a principle distinct from those governing the behaviour of non-living substances, but every advance in laboratory science seemed to diminish the territory in which such a theory could find a foothold. Medical science was confined to what could be seen or handled, weighed, or measured, and even if conceptions had sometimes to take the place of observation they were assumed to deal with the same order of things. The

modern use of the word "neurosis," for example, to denote alterations in behaviour or emotion, followed upon speculations concerning the relations of psychic and neural activity, and calls up a picture of something pathological that could be seen if only our instruments of observation were perfect: but, although an intimate connexion must exist between psychic and neural activity, yet to describe a known activity in terms of the unknown seems to be a straining of hypothesis in order to maintain a particular philosophy. This philosophy, unchallenged for half a century, profoundly affected our outlook, and the study of the patient as a whole, of his mental or emotional states, received till recently but little recognition in medicine.

The first intrusion into our settled beliefs, much resented by some, came from the psycho-analytical quarter and, whatever may be the ultimate fate of psycho-analytical theory, the influence of unconscious processes in the production of what we call functional nervous disorders is now widely accepted. Clinical psychology, however, seemed to have little to offer in the understanding of undoubted organic disturbances, although a close study of the literature shows a surprising variety of conditions in which shock or worry are said to be exciting causes. What appear at first sight to be typical physico-chemical phenomena have given Prof. KARL HANSEN, of Heidelberg, the opportunity to enlarge upon what he calls "the unity of the person" in a paper on allergic and psychic factors in asthma, read before the Section of Medicine of the Royal Society of Medicine and reported in our issue of March 2nd. He took as his text the case of a woman who showed sensitivity to horse-dandruff and bed-feathers, but whose asthma always set in when a situation was created that awakened a severe inner conflict from which she could find no escape. When the crisis was over the attacks stopped, whether the patient had found a real solution or apparent relief through transference. This single example may be compared with observations made at Edinburgh (THE LANCET, March 9th, p. 517), which showed that psychic disturbance caused attacks in 40·6 per cent. of cases of asthma there investigated, and a recent correspondence in our columns showed that there was need for some hypothesis that would correlate observations made by those who approached the subject respectively from the physical and the psychical side. Prof. HANSEN takes the general view that psychical factors influence the disposition to disease in the presence of known pathogenic substances influencing the organs, and to illustrate this view turned to allergic diseases in particular, the dependence of which upon psychic influences was, he said, well known, the intrusion of the allergen only leading to asthma when the way was prepared by these influences. He suggested that even in the presence of an organic defect the symptom might have a meaning to the patient, in the same way that the neurotic symptom has a meaning which can be elucidated by analysis. Some important suggestions found expression in the discussion that followed the paper. Both PAVLOV'S experiments on conditioned reflexes and our recently acquired knowledge of the vegetative nervous system have been regarded as providing alternatives to the possibility of psychical factors influencing bodily processes. Accepting the principle of the unity of the person, the speakers found a place for these studies and looked to them to provide explanations of the mechanism by which this unity is maintained, or by which alterations in the psychic equilibrium find expression in bodily symptoms. Though this principle may appear new, yet it sums up conceptions that have been gradually developing, and it only needed to be enunciated for us to appreciate its usefulness in reconciling the views of workers who have approached the same problem by different routes.

BIOLOGICAL KNOWLEDGE.

WHATEVER else he may be as well, there is no doubt that man is an animal; he is in fact in most respects by far the best studied species of animal there is. In introductory addresses and on other occasions of exalted emotion, medicine is sometimes described as a branch of applied biology, and biology is sometimes called the handmaid of medicine; suspecting that they lay under some suspicion of being mere technologists, Sir ARCHIBALD GARROD, the late Prof. J. G. ADAMI, and others have been at some pains to indicate the points of biological importance which may arise from professional experience. Everyone agrees in short that biology and medicine are intimately related to one another, and the connexion has become still closer with the newer biology of this century in which function as well as form has its place. The trouble of maintaining and enlarging this relation is the trouble of relating any of the disciplines into which we classify knowledge to one another—the limited capacity of the human mind. The position in medicine and the medical sciences is dreadful enough; as our principal American contemporary said the other day, the plethoric condition of medical literature has assumed the purple tinge of a fatal polycythæmia. We doubt whether it is quite as bad as that; purges and venesection can help a great deal, and the *Quarterly Index*, *Physiological Abstracts*, and such publications may yet succeed in staving off the post-mortem at which the only conclusion could be that no one must write any more books or papers. Such a contraceptive verdict might do little harm to the progress of knowledge; it has been said that if we knew all that is at present known we should find that most of the problems we think need solution have already been solved. This is probably largely true, but writing papers is an excellent exercise for the writers and the ordering of their thoughts, and it gives a procreative outlet in these days of birth control. It would be a pity to stop it altogether, though it might have rather more eugenic restraint.

If this is the state of affairs within the field of medicine, how hopeless it may seem to bring medicine into any sort of effective contact with the whole scattered field of biology. But courage can achieve most things, and a first step has been made by the promoters of *Biological Abstracts*,[1] who in 1927 began a monthly publication with no smaller object than to summarise the whole of current publications in biology, to abstract the relevant parts of some 6000 journals and to make the results available to everybody. Judging from their first two years they have made a good start at what seemed at first an impossible task, and, aided by a grant from the Rockefeller Foundation, they have issued a periodical which no one can read, but which almost everyone can consult with profit. Biology as a whole is gathered up together, and so it is very much easier for outsiders to find out what is going on. Revelations come as often as not from browsing about a little outside one's own proper field. It would, we believe, be a mistake for Dr. J. R. SCHRAMM and his colleagues to try to include medicine in their purview; it has the largest

[1] University of Pennsylvania, Philadelphia, Pa., U.S.A. Personal subscribers $9 per year.

current literature of any subject and it is already tolerably well served by abstracts and indexes. Medicine, it is true, can make substantial contributions to general biological theory, but much of its literature is extremely specialised and often ephemeral, and we should be sorry to see the real value of *Biological Abstracts* endangered by overcrowding. It has yet to find its permanent feet in conventional biology, though it has done enough to show that it deserves all encouragement and support.

Quite recently, too, the literature of man has been enriched or encumbered—time will show which—by another quarterly edited by Prof. RAYMOND PEARL. "Human Biology" [2] is a record of research, not a review, and its object is to publish original contributions which have this in common, that they will tend to synthesize a general biology of man. The first number happens to contain one article of particularly medical interest in which an account is given of the methods in use at the Institute of Biological Research in Baltimore and the Johns Hopkins Hospital for the vast inquiry into the constitutional factor in disease which has gradually come into being during the last ten years. Others deal with the sex factor in infant mortality, the mental capacity of different races and so forth, and the editor professes once again his faith that there is no need to be solemn if you want to be serious; we should call his own note on the mortality of some brewery employees no better than frivolous.

Annotations.

"Ne quid nimis."

THE DRAMA OF NAPOLEON III.

AT the Royal Society of Medicine on Wednesday, March 20th, Dr. Leonard Williams told the story, with profuse illustrations on the screen, of the most dramatic figure of the nineteenth century, Charles Louis Napoleon Bonaparte, for four years President of the French Republic, which followed upon the fall of Louis Philippe, and from 1851, until the disastrous Franco-German War, Emperor of the French. The career of the Emperor as set forth by Dr. Williams amply proved the description given of him as an arch-conspirator, but the lecturer's main object was to show that the story possessed great medical interest. This also the disquisition proved, and we must assume that Dr. Williams was well documented before he definitely laid to the charge of pathological developments so great a share in the disastrous finish of the imperial adventurer's life. The early events of this life were told by Dr. Williams with deliberate brevity and a choice of caustic language that contrasted excellently with the grand, and often grandiose aspirations of Louis Napoleon; in a few sentences he covered the interval of intrigue and pleasure which is supposed to have suggested to Eugene Sue the character of Rodolphe; but he related the sensational story of the escape from Ham as such a story should be told, that is with gesture and with relish of the situations that were being depicted, and closed this part of his address with a description of the daring intriguer seated on the throne of France by what looked like popular acclaim, and married romantically to one of the most beautiful women in Europe. At this stage pathology enters and Dr. Williams described, in a way that was all the more terrible because simple words were used and flippant comments were interspersed, how the miseries arising from a vesical calculus helped to ruin the usurper's prestige in France, to alienate the affections of a profoundly ambitious spouse, to warp his judgment in the conduct of international affairs, finally to leave him the victim of unescapable tragedies. On the last passage in the life of Napoleon III., when as a sick and elderly man he sought refuge in England, Dr. Williams gave information that was probably new to his audience, and many, like ourselves, will wonder where support can be found for a daring surmise which would account for the closing scene of Louis Napoleon's life. The details of that scene are historical and were given in THE LANCET at the time.[1] The Emperor was submitted a few days before his death to two belated attempts to relieve him by lithotrity of a calculus whose presence could be easily associated with sufferings that he had endured for many years, and on the morning of the day when for the third time operative interference had been planned, he died before Sir Henry Thompson had commenced to operate. The account of the autopsy, signed by all the Emperor's advisers except Sir William Gull, was published in our columns, as was Sir William's minority report, and the documents were the subject of considerable comment from the medical point of view in many quarters, for they revealed circumstances which would usually be considered to constitute a bar against operative interference. It was not here that Dr. Williams did more than summarise contemporary documents; the sensational part of his address was to come when he suggested that the operations were undertaken at the Emperor's order. Louis Napoleon must have been told by Sir Henry Thompson, said Dr. Williams, out of Thompson's vast experience that the operative interference possible at that date would be extremely dangerous, but none the less the Emperor himself insisted. Why? asked Dr. Williams, replying, "Because Louis Napoleon was resolved to make an attempt to regain the French crown. He intended to make an Elba-like return in emulation of Napoleon I., and felt that such return could only be successfully staged if he rode with the troops."

THE BRITISH JOURNAL OF UROLOGY.

UNTIL this month no journal devoted to urology was published in this country, and the newcomer [2] fills an undoubted gap in English medical literature. Its editors, Mr. Frank Kidd and Mr. H. P. Winsbury White, are responsible to a strong editorial committee, and in their foreword to the first number they state the objects of the journal. The pioneer work of Sir Henry Thompson, Sir Henry Morris, Mr. Hurry Fenwick, and Sir Peter Freyer laid the foundations of a school of British urology which is enlarging its scope and numbers every year, and includes workers not only in our own islands, but in Egypt, India, and the British Dominions. The promoters of the journal hope not only that it will unite British urologists in closer harmony, but that it will also interest workers in other countries, and its editors make a special appeal to English-speaking urologists in America. They hope to publish in every number one paper from the pen of an American author, and to assist visitors from abroad they propose to include in each issue a list of the chief British urological clinics. Other constant features are to be papers of interest to the general surgeon and general practitioner; a regular series of abstracts of current urological literature with an index conceived on modern lines; notes on developments of interest to urologists in biochemistry, chemotherapy, and radiology; and advertisements of novel and useful aids to the science. The first number contains seven original contributions: Mr. Andrew Fullerton describes drainage of the bladder through the perineum after suprapubic prostatectomy; Dr. P. J. Cammidge and Mr. H. A. H. Howard write on an improved method of

[2] Warwick and Yale, Baltimore, Md., U.S.A. $5.40 per year.

[1] THE LANCET, Jan. 11th and 18th, 1873.

[2] British Journal of Urology. Published quarterly by Constable and Co., London, 6s. (annual subscription, £1).

titrating sugar in urine and blood; Mr. Victor Bonney contributes a paper on the gynæcological aspect of urology; Mr. Duncan Morison gives an account of experimental work on routes of absorption in hydronephrosis, carried out with dyes in the totally obstructed ureter; Mr. R. Gordon Craig and Mr. R. K. Lee-Brown write on the pyelographic diagnosis of renal tumour, and Dr. Maurice Meltzer, of New York, on the surgical aspects of polycystic disease of the kidney, while Mr. H. Temple Mursell relates the after-history of a case of nephrectomy for polycystic kidney. Other features are notes on interesting cases, urological hints for practitioners, biochemical notes, a copious body of abstracts, and an index medicus. The size of the publication is quarto; it is printed on highly glazed paper and illustrated with many excellent radiograms, photographs, and drawings. The coloured plate by Mr. Thornton Shiells, illustrating a hydronephrotic kidney with a suprarenal cyst in sagittal section, is an admirable example of lithographic work.

We wish our new contemporary many happy returns of the day.

IMMUNITY TO CANCER.

WHEN a small piece of a tumour is inoculated into an animal of the same species as that in which it originated spontaneously, the inoculated cells continue to grow and form a new tumour, the host supplying them with nourishment by means of the new blood-vessels of the stroma which it furnishes. It is possible experimentally to affect an animal in such a way that the inoculated tumour cells do not grow and do not form a new tumour. They remain alive for a few days and are then absorbed; they behave, in fact, just as normal tissue transplanted from one animal to another of the same species. This condition has been described as "immunity." It can be induced by injecting animals, before the inoculation of tumour cells, with normal tissues of the same species, and it is also induced when a transplanted tumour is made to undergo regression—for instance, by means of radium. When the phenomenon was first discovered 25 years ago, it seemed to have possibilities of therapeutic application. But exhaustive investigation by workers of the Imperial Cancer Research Fund served to disappoint these hopes. It was found that the blood of an "immune" animal had no toxic or lethal action on the implanted cells. If an animal bearing an implanted tumour was rendered "immune" by the injection of normal tissues, so that a second inoculation failed to take, the tumour inoculated before "immunisation" was not checked in its growth but continued to grow. Moreover, where a malignant new growth had developed spontaneously, injection of normal tissue failed to render the affected animal immune against the successful inoculation of its own tumour, and a spontaneous development of tumours was observed in "immunised" animals. The conclusion was inevitable, therefore, that the condition was not an immunity against cancerous cells, but rather an interference with the process by which the inoculated cells of one animal established themselves in another animal of the same species. It is not an "immunity to cancer" but an "immunity to the transplantation of cancer."

Work on this subject up to the year 1913 was reviewed by Dr. W. H. Woglom, of the Crocker Cancer Research Fund of Columbia University, in his book The Study of Experimental Cancer,[1] and in the March number of the *Cancer Review*[2] he gives us an account of the further investigations carried out between 1913 and 1928. His paper is a truly monumental contribution to scientific literature and has been prepared with the thoroughness characteristic of its author. The bibliography contains references to more than 600 papers and a study of the text makes it clear that Dr. Woglom has read almost all of these in the original. Nor is it a dry compilation of observations and conclusions recorded in the literature, for it is severely critical in tone. Of a number of conclusions which are reached the following may be quoted: "Immunity to transplantable tumours is a generalized refractory condition which appears to be entirely unrelated to other forms of immunity... The outcome of inoculation is determined by an interplay between the hostility of the host and the proliferative vigour of the implant, hence an absolute immunity does not exist... Resistance is effective during the first few days following inoculation, but entirely powerless against an established tumour. Nothing may accordingly be hoped for at present in respect to a successful therapy from this direction."

There is, however, an entirely different immunity to cancer which has been disclosed by the recent work of Dr. J. A. Murray and his colleagues. This immunity is directed not against the successful inoculation of cancerous cells but against the transformation of normal cells into cancerous cells. There are systemic factors which determine the susceptibility of an organism to the genesis of cancer. Some aspects of this problem were dealt with by Dr. Murray in the Twenty-fifth Annual Report of the Imperial Cancer Research Fund and their significance was discussed in our columns.[3] It is obvious that if further progress along these lines is possible it would be in the direction of preventing cancer rather than curing it.

[1] The Study of Experimental Cancer. New York. 1913.
[2] Immunity to Transplanted Tumour. The Cancer Review, March, 1929.

ARTHRITIS DEFORMANS AND ACCIDENTS.

IN persons of rheumatic tendency slight injury may determine the localisation of the malady in a particular joint. At the recent meeting of the Royal Society of Medicine R. G. Gordon[4] emphasised the importance of trauma at the onset of cases of arthritis deformans, and it is common experience, too, that in the later stages of the disease, when patients become awkward and clumsy in their movements, a bad fall may follow a slight slip or trip, and fractures may result from a trifling cause. The formation of callus may be poor and union is sometimes much delayed. The association of accident with cases of arthritis deformans is of considerable importance when claims for compensation are likely to be made. E. Sonntag[5] lays down the following guiding principles for assessing these cases: (1) The accident must be well authenticated; retrospective claims should be viewed with suspicion. (2) The accident must have involved the joint concerned; if many joints are affected, an alleged accident probably had little to do with the disease. (3) The accident must be compatible with the injury, and sufficiently severe. The evidence is stronger when the claimant had to stop work and seek medical attention, and when there is injury to the skin and loss of blood. Effusion into a joint is not enough, since this often occurs in the course of the disease itself. (4) The time relationship must be considered, though here there is some latitude. The case is strengthened if the disease begins soon after the alleged accident. (5) A full investigation should be made for evidences of arthritis elsewhere. X ray examination is of special value, and should include comparisons with the corresponding joints of the opposite limb. Spondylitis is an important manifestation of arthritis deformans. It may be present to a gross extent without any disability; but symptoms may follow a slight injury, and often a severe hysteria is superadded. The statements of the patient and even of the witnesses must be thus sifted with care. Careful weighing of the evidence and a knowledge of the character and previous history of the claimant will usually enable a just decision to be made. It is in this type of case where medical experts may be approached by either side that a sharp conflict may result between

[3] THE LANCET, 1926, ii., 1139.
[4] THE LANCET, Feb. 23rd, 1929, p. 395.
[5] Klin. Wochenschr., 1929 viii., 474.

the views of those called in. Such conflict often brings medical evidence into disrepute in legal circles, and could doubtless in large measure be avoided by the general acceptance of a few basic principles such as those laid down by Dr. Sonntag.

THE PROGRESS OF CREMATION.

THE Cremation Society of England was founded in 1874, and 11 years later, after the famous Welsh Druid case, in which Mr. Justice Stephen held that it was not an offence to burn a dead body, the first crematorium in this country was opened at Woking for public use. Since that time progress has necessarily been slow, but the 1928 report of the Society shows that the number of cremations has been increasing more rapidly during the last few years than formerly. In 1928 there were 3436 cremations, as compared with 3265 for the previous year, and this represents nearly 30 per cent. increase on the previous five years' average. Twenty crematoria have now been established in the British Islands, the two latest being at Bristol and Ipswich. The erection of one in Guernsey has been sanctioned by the State Committee, and it is anticipated that the building will be opened for public use during the present year, whilst in Edinburgh also a crematorium is in course of construction. The Council of the Society notes that the growth of cremation is comparatively slow in many of the provincial centres, and it seems obvious that the provision of a crematorium is not enough; there must also be sustained local propaganda in its favour. During the year papers on cremation were read before a conference of the National Association of Cemetery Superintendents and at the Congress of the Royal Sanitary Institute at Plymouth, and the Central Council of Health Education has permitted the Cremation Society to attend the numerous Health Week exhibitions held in various parts of the country. Lectures to societies and guilds have also been arranged, but from the economic point of view little immediate result can be expected among the less wealthy classes of the community. At the same time the spread of knowledge to the masses may well enable some sort of industrial insurance scheme to be established in the future, so that cremation at death may be available to all who want it. In the meantime the Society is well advised to go on advocating cremation from the æsthetic side rather than the standpoint of economics and sanitation, for sentiment is probably the greatest obstacle to its universal adoption. Gardens of rest or remembrance have become ordinary adjuncts to a crematorium and represent a compromise with those who look upon the cemetery as a desirable feature of every town or city, on almost the same footing as a public park.

One practical point about cremation should perhaps be better known. If cremation is desired, it is necessary to inform somebody of this fact beforehand, and the will is not a suitable document for conveying the information as often it is not opened until after the funeral. The practitioner should bear this in mind if he is called upon to give advice about cremation—advice which more and more people are likely to ask of him.

AN OUTBREAK OF BRILL'S DISEASE IN ROME.

DURING the summer months, and more particularly in August during the last few years, a febrile malady has made its appearance in Rome. The pyrexia lasts 10–15 days, running a uniform course and is accompanied by an exanthem of somewhat indefinite character, and the disease is not contagious. A favourable termination is the rule. Outbreaks have occurred from time to time since 1920, but in 1927 and 1928 they became more numerous, 36 cases being notified in 1927 and 65 in 1928. The clinical picture corresponds to that of Brill's disease, which is held to be an attenuated form of typhus fever. The illness begins with fever and headache; the exanthem, which appears on the third or fourth day, takes the form of scarcely raised maculæ of various size from a millet seed to a lentil, round, reddish in colour, and frequently becoming petechial. The rash appears simultaneously on the trunk and limbs and after two days becomes diffuse over the abdomen and back and sometimes on the face. Among those attacked in 1927 and 1928 only three patients succumbed, two of them being of advanced age and suffering from chronic vascular and cardiac lesions. In the only case where death seemed entirely due to the disease histological examination of the skin showed the changes in the capillaries and the perivascular infiltration characteristic of typhus fever. Persons of all ages and both sexes were attacked. Epidemiological investigation revealed the fact that 95 per cent. of the patients lived in districts where a species of tick, *Rhypicephalus*, infected the dogs; some of the patients asserted that they had found these parasites on their bodies and exhibited cutaneous lesions strongly suggesting their presence. The close relationship between the disease and typhus fever was further indicated by the fact that the Weil-Felix reaction was positive in the majority of cases, at least in adults, when the blood was tested at a late stage of the attack or during convalescence. In children the Weil-Felix reaction was usually negative, possibly because in them the disease took a very mild form. Agglutination tests on patients affected by the outbreaks showed that the thermostability of agglutinins could not be regarded as a reliable method of differentiation between typhus fever and Brill's disease. The fact that in the Rome epidemic the virus was an attenuated one is associated, according to G. Pecori, of the Department of Public Health,[1] with the nature of the insect carrier of the virus. The louse is excluded as a carrier in Brill's disease, Marseilles fever, and the Rome epidemic. In the absence of lice, other insects must be implicated, and all the evidence seems to point to the dog tick. These ticks, which have a summer development cycle, are believed to carry the virus from unknown habitats to healthy persons. The modifications the virus undergoes during its passage through an intermediate host other than the louse may account for the changed epidemiological characteristics of the outbreaks which are transformed into a summer infection, sporadic, non-contagious, and running a mild clinical course. This attenuated form is called by Pecori "non-spreading summer dermotyphus." The appearance of dermotyphus of Brill's type in any locality does not in the least degree constitute an index of epidemic recrudescence of true exanthematous typhus.

CEREBRAL FORMS OF INFANTILE PARALYSIS.

ACUTE poliomyelitis may present itself clinically in many different ways but sooner or later as the disease evolves most cases reveal themselves as due to infection of certain parts of the spinal cord. Sometimes the virus seems to attack the higher parts of the nervous system such as the brain-stem, whilst the existence of frankly cerebral forms of the disease, leading, for example, to hemiplegia, was suspected as long ago as 1885 by Pierre Marie. The cerebral varieties, which may take the form of a pure encephalitis, often lead to difficulties in diagnosis, the physical signs depending very much on what part of the brain the virus attacks. Parkinsonian symptoms have been reported by Marinesco and the confusion of epidemic lethargic encephalitis with polio-encephalitis is by no means uncommon or surprising. Thus Mouriquand and co-workers[2] have lately described the case of a boy, aged 4, who died after only five days' illness which took the

[1] Il Policlinico, Practical Section, Feb. 4th, p. 151.

[2] Mouriquand, G., Bernheim, M., and Dechaume, J.: Jour. de Méd. de Lyon, Feb. 20th, p. 105.

form of an acute encephalitis. The child suddenly became weak in all his limbs and in his neck, with fever and curious chewing movements of his lower jaw. Lumbar puncture showed a clear fluid containing many lymphocytes with a normal sugar content and increase in the protein. The weakness in the limbs quickly became an actual paralysis, the pulse-rate grew very rapid, and the boy died. Onset of the disease was accompanied by somnolence from which he could be roused and there were no convulsions. The curious movements of the jaw were considered very similar to those sometimes seen in epidemic encephalitis and in lenticular degeneration, and it was this apparent affection of the regions of the basal ganglia which led to suspicion of lethargic encephalitis. Autopsy, however, showed quite clearly that this was a case of polio-encephalitis, and typical changes were found in the subthalamic region, in the floor of the fourth ventricle, and in the region of the origin of the trigeminal nerve. It is generally accepted that the morbid histology of the lesions in poliomyelitis and in lethargic encephalitis have points of clear distinction even if the parts of the brain attacked are the same, as in the case here related. What is not so readily recognised is that the clinical resemblance may be very close. The illness usually begins more suddenly in polio-encephalitis, with more evidence of an acute infection, while rapid onset of flaccid paralysis of one or more limbs is of help in diagnosis, though not, of course, present in pure encephalitis. Lumbar puncture and examination of the cerebro-spinal fluid is not of much assistance as the findings in the two conditions are similar. Mouriquand mentions the "neutralisation of the virus" test introduced by Netter and Levaditi, but this is in a sense retrospective only, for it depends on the fact that the serum of the convalescent polio-encephalitis patient will neutralise the poliomyelitis virus and render it harmless on injection into a monkey. Injections into monkeys of portions of the central nervous system from cases of polio-encephalitis reproduce the disease, but this is obviously useless in diagnosing the nature of encephalitis in a living patient and some biological test is wanted for this. A test of this kind would be especially valuable if such sera as that of Pettit, used extensively for poliomyelitis in many centres, is to be employed in the early stages of polio-encephalitis; and it is in these early stages that clinical diagnosis is so very difficult.

LATE CONGENITAL SYPHILIS.

AN elaborate study of late congenital syphilis is contributed by Dr. Walther Krantz, of Cologne, to one of the latest volumes of the work on general medicine now being issued under the general editorship of Prof. Brugsch, of Halle.[1] This form of congenital syphilis is now well recognised clinically. It may be a sequel to manifestations in infancy or it may appear, without previous indications of the taint, at the second dentition, at puberty, or even in early adult life. Indeed, the age-limit for the first appearance of signs of the disease is hard to set. Tabes and dementia paralytica are rare but well-known final stages. Full reference is made by the author to the work of Hutchinson to whom is due the clinical recognition of the malady and descriptions of the pathognomonic alterations in the teeth, interstitial keratitis, and disturbances of hearing, known as "Hutchinson's triad." The features of the malady may be grouped under four headings, but it is emphasised by Dr. Krantz that the incidence of the manifestations, with the exception of the very constant interstitial keratitis, varies. There is usually mental and physical infantilism of some degree; primary and secondary sexual development tends to be retarded. Certain stigmata are prominent. These include Hutchinson's teeth, Moon's dome-shaped molars, fissures and rhagades about the mouth, bossing of the calvarium, and depression of the bridge of the nose. The sundry cutaneous and mucosal lesions may be hard to differentiate from those of acquired syphilis. These stigmata are well illustrated in Dr. Krantz's article by photographs of cicatricial, destructive, and hyperplastic lesions of the face and skull. "Saddle-nose," "bull-dog nose," and "opera-glass face" are terms which appear under some of the pictures. Thirdly, the skeletal changes include Clutton's synovitis of the knees, usually but not always bilaterally symmetrical, and the sabre-shaped tibiæ in which the bone is increased in bulk by gummata and chronic osteo-periostitis. Lastly, the changes in the special senses are noteworthy. Interstitial keratitis, unilateral at first and then bilateral, appears during the second dentition. A haziness in the centre of the cornea quickly gives place to a general "ground-glass" effect. Visual disturbance and photophobia occur. Middle-ear disease is almost as constant as interstitial keratitis, but it takes place in earlier life. Dr. Krantz has supplied an adequate account of the disease in all its manifestations.

[1] Ergebnisse der Gesamten Medizin. By numerous contributors. Under the general editorship of Prof. Brugsch, Director of the Medical Clinic of the University of Halle. Vol. xii. Part 1. Berlin: Urban and Schwarzenberg. 1928. Pp. 294. M.35.

THE EPIDEMIOLOGY OF CHOLERA IN INDIA.

FROM bulletins of the Health Section of the League of Nations it is evident that India is the only part of the world where cholera still exists in epidemic form. Considering the heavy loss of life the disease causes there, it is surprising that so little attention has been paid in the past to its epidemiology. Fortunately this has been remedied to a certain extent of late years, owing to the better facilities given to the public health authorities. In making his well-known observations on cholera, Colonel W. G. King indicated clearly that the chief cholera season would follow closely the chief monsoon, and this "cholera clock," as he called it, is still found to beat true to time, the maximal incidence being reached six to eight months after the rains begin. The climatic factor is prominent among those considered in a recent review[1] of the subject forming one of the series of Indian Medical Research Memoirs. The analyses prepared by the authors are calculated from a large number of statistical tables and give only very generalised correlation coefficients to cholera and climatic factors, so that, in order to reach more definite conclusions, collected statistics will have to be re-examined in greater detail. The incidence of cholera in Assam and Bengal varies from that met with in other parts of India. Rainfall per se does not have that relationship with the incidence of cholera which has been demonstrated in other provinces; in fact, the correlation coefficients are all negative in sign. Hence, in Bengal rainfall and cholera are inversely relative, so that with the progress of the rains cholera practically disappears, and in these areas it may be said that cholera epidemics seem to be independent of weather conditions. In attempting to explain disease phenomena many factors have to be taken into consideration, such as weather, seasonal incidence, race distribution, sex, age, social status, and poverty; but in statistical analysis only a few of these can be dealt with, owing to the difficulty of obtaining the requisite data. Consideration of climatic factors alone has demonstrated the important part played by humidity, but we must assume that during the pre-epidemic phase some process goes on which leads to a progressive alteration in the equilibrium between parasite and host, and that an epidemic wave of mortality is propagated only when a certain limiting condition has been reached.

[1] The Epidemiology of Cholera in India. By Lieut.-Colonel A. J. H. Russell, C.B.E., I.M.S., Director of Public Health, Madras Presidency; and E. R. Sundararajan, M.A., Vital Statistician, Bangalore, Indian Medical Research Memoirs, No. 12, 1928.

PRINTERS AND PHTHISIS.

THE printing trade, employing roughly a quarter of a million persons, is nearly the largest of our factory industries. Those occupied, not only in this country, but also elsewhere, have long been known to have a high mortality from tuberculosis, but not from any other great cause of death. This curious combination of a low general death-rate with a high phthisis death-rate has been shared with the printers by the tailors and the bootmakers. The first report of the Medical Research Council was devoted to investigating this phenomenon among bootmakers, among whom, however, no specific trade risk was disclosed to account for it. In 1925 the printing trade invited the Industrial Fatigue Research Board to investigate the subject; and the result is now published of an intensive and painstaking inquiry made into the incidence of sickness, both from tuberculosis and from other causes, among different occupational groups within the industry. The long and intricate analysis of sickness records is by no means easy to follow, but the reader's task is simplified by a short preface outlining the method adopted and the results reached. Briefly this elaborate inquiry has left unanswered the question of the printer's liability to tuberculosis; certainly no trade risk has come to light. The printer's general sickness incidence, like his general mortality, is found to be low; yet his reaction to tuberculous infection, which is usually regarded as an index of general resistance to disease, is in excess. Consideration of the different occupational groups gives but little light and leading; the compositors, it is true, suffer in youth from an excess of general sickness and of tuberculosis, but they do not maintain this adverse experience after the age of 30. The warehouseman takes up the toll from the age of 30 to 50, overlapped by machine workers from age 40 to 60. No interchange of personnel takes place between these groups, which are separately recruited, to account for the facts observed. Possible explanations, regarding unfavourable working environment or the recruitment of the physically weak, are only mentioned to indicate lines for further investigation, particularly by medical examination of apprentices at entry. Few pieces of research have more clearly demonstrated the difficulty of acquiring adequate data from which sure deductions can be drawn about the connexion between morbidity and mortality. Yet it is in this field that knowledge is lamentably lacking. How can we pursue a sure line to attain resistance to this or to that infection, whether of tuberculosis or of influenza, unless we know the "sickness type" which tends to succumb? New methods of analysis, possibly quite diverse from those with which we are familiar for mortality records, are needed, and are being developed in America [2] as well as here; and appeal is being made particularly to industrial records to provide the facts required.

Sir Berkeley Moynihan, on his elevation to the peerage, has taken the title of Baron Moynihan of Leeds.

AT a meeting of the Fellows of the Royal College of Physicians of London held at the College on Monday last, March 25th, Sir John Rose Bradford was re-elected President.

WE regret to announce the death in London on March 23rd of Dr. Alexander Granville, who was at one time President of the International Quarantine Board of Egypt.

Mr. A. E. Cumberbatch, who died at his home near Rickmansworth, on March 23rd, was the first aural surgeon to St. Bartholomew's Hospital, holding office for the 25-year period from 1882 to 1907, and a life-long contributor to our knowledge of the surgery of the ear. He was in his eighty-second year.

[1] An Investigation into the Sickness Experience of Printers. By A. Bradford Hill, Ph.D., Report No. 54, Industrial Fatigue Research Board, H.M. Stationery Office, pp. 114, 4s. 6d.

[2] Frequency of Disabling Sickness among Industrial Employers. Public Health Reports, U.S. Public Health Service, Feb. 22nd, 1929.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXC.—THE TREATMENT OF VULVAR AND ANAL ECZEMA.

PART I.*

Pruritus and eczema of the vulva and anus are amongst a group of distressing maladies for which even in these outspoken days many women seek no medical aid, preferring to suffer in silence. One life-long friend never mentioned to anyone the irritation which had troubled her since the age of 17, until she found a growth developing in her sixty-fifth year; this was malignant and was excised just in time. Excluding uncomplicated "eczema marginatum" I have notes of over 130 cases cured in private practice during the past 18 years. I have recently tried to trace them all, but many letters were returned undelivered. Fifty-two reported no relapse; 12 reported slight recurrences with which they could deal unaided; five cases return every few years because the causal agent cannot be permanently eradicated.

Pruritus of the anus may be severe, even when little abnormal is visible on examination. If it is progressive the perianal tissue becomes swollen and sodden, with thickened ridges and fissures, and the eczematous condition spreads to the buttocks and forward to the vulva. When the intergluteal fold is involved a most painful fissure usually follows. Pruritus and eczema of the vulva takes many forms, varying from the milder types which show a scarcely perceptible hyperæmia, or a chronic white leathery appearance over the inner aspect of the thickened labia, to the enormously swollen and painful condition which is seen when the eczema is fissured and œdematous and extends to groins and intergluteal fold. Even in the mildest cases the irritation may be intense, leading to ungovernable scratching, especially at night, when self-control is diminished. The patients become depressed and suicidal, not only from lack of sleep, but from despair over the failure of most local applications to bring about more than a slight alleviation of their misery.

Causation and Prognosis.

With eczema or pruritus ani it is usual to find some degree of constipation, which may be or may not be accompanied by hæmorrhoids. Even when there are no bleeding piles, the examining finger frequently encounters a constriction just within the rectum. When this is present, and also in the capillary type of hæmorrhoids, the prognosis is good. Treatment with the high-frequency metal or vacuum electrode causes disappearance of these forms of piles, and coincidently the irritation improves. On the other hand, the prognosis is bad with deeper-seated piles and when there is a small muco-cutaneous pile at the posterior margin of the anus. These do not respond except to surgery or diathermy, and till they go the pruritus or eczema tends to relapse. The presence of worms is a not infrequent cause of anal irritation in children, but is not often a cause in adults. Pediculosis is a rare cause in private practice. Colitis and diarrhœa, the latter especially in children, are common exciting causes. The general health and whole intestinal condition must be dealt with before the anal condition will cease to relapse. Psoriasis may affect the ano-genital region, and become eczematised; it is very rebellious to treatment. Only within recent years have I become aware that the leakage from the rectum of mineral paraffin preparations can set up intense irritation, spreading even to the vulva and vagina. Once this is known it is easily dealt with; probably this was the unrecognised cause of several relapses, for which I could find no reason in previous years.

* Part II. will appear next week.

Cases are sometimes seen with slight discharge, but marked hyperæmia extending a short way up the vagina, with continual relapses until the husband undergoes treatment. Castellani has drawn attention to a fungus which he found in 11 out of 54 cases of anal pruritus. Even with severe pruritus ani nothing may be seen, or only tiny infiltrated red patches. When scratched these become secondarily infected with streptococci. This condition often has periods of remission and is very obstinate.

When the eczema affects chiefly the vulva the prognosis and treatment of the case depend upon the removal of the cause, and this is often hard to trace. One should note whether the irritation is restricted to the vulva, whether it extends up the vagina, or to the groins, thighs, and pubis, or whether it extends to the rectum and intergluteal fold. Eczema marginatum, due to the *Epidermophyton inguinale*, has become much more frequent since the war. Advice is usually sought in the early stage, when red patches, slightly scaly, are beginning in the groins and spreading to the genitals and thighs, even to the abdomen. The sharply defined margin on the skin is so characteristic that one rarely has to examine for fungus in order to make the diagnosis. If the disease is not dealt with early the vulva becomes thickened and eczematised. The prognosis is excellent. Leakage of paraffin from the bowel can cause intense vulvovaginal irritation with hyperæmia, and is usually unsuspected when the anus and perineum remain healthy, as frequently happens. Diabetes is a well-known cause of severe eczema of the vulva, but is not so frequently met with as other causes in dermatological practice. When only the genital region is affected the condition is usually due to infection from the bladder or the vagina. In young girls vaginal discharge is often due to *B. coli* and the local condition is often difficult to deal with.

A vaginal or a cervical discharge is, I believe, the most common cause of intractable eczema of the vulva in the adult. Sometimes this discharge is quite at the entrance of the vagina, and is then usually due to *B. coli* or the gonococcus. A catheter specimen of the urine should be taken and the condition of the urethra noted; a slight urethral discharge is easily overlooked. When the vagina seems clear, except for a slight milky discharge, it is not safe to assume that the source of the irritation is not a uterine discharge. Even when the patient denies the existence of any discharge, after the introduction of a speculum an erosion of the cervix with thick muco-purulent discharge is often found, and the reason for the external irritation is at once obvious. For long I did not recognise the importance of a scanty amount of clear mucus without any erosion. Within recent years I have had convincing proof that this scanty clear mucus is capable of causing marked irritation and eventually eczema. This clear discharge is usually found to contain streptococci, but may also show gonococci. Treatment of the discharge in such cases alleviates, and return of the discharge causes renewal of the irritation. In some cases it is most puzzling to trace any causal agency. One healthy young woman who had a continually relapsing eczematous patch near the anus, but an otherwise healthy skin, remarked one day that the irritation vanished when she was at the seaside or in mountain air. This put me on the track, and on inquiry regarding dietetic excesses, I found that when at home she indulged freely in sweets and chocolates. One is apt to forget that patients do not follow out advice on diet for more than a restricted period of time; in chronic and relapsing cases inquiry must continually be made as to whether all directions are still being followed.

A rare cause of intense irritation is leukoplakia vulvæ. The mucous membrane shows in the early stage hyperæmia, telangiectases, and bluish, atrophied, or milky-white patches. The irritation does not respond to the usual treatment. Fissures appear from which later on malignant growth develops. In the final stage all the parts become smooth, atrophied, and contracted. Kraurosis vulvæ is often confused with the late stage of leukoplakia, but in the former the urethra and vestibule are always involved; there is more soreness than pruritus, and no malignant tendency. Four cases of leukoplakia vulvæ which I have seen I passed on to be dealt with by surgeons. One case, which I believed to be an early leukoplakia, with definite hyperæmic patches, telangiectases, a few bluish-white patches, and severe irritation, became completely cured when I stopped the strong disinfectant vaginal douches which the patient was in the habit of using daily, from mistaken ideas of hygiene. Four years have passed and there has been no relapse.

General Management.

Strict attention must be paid to rules of hygiene. No constipation dare be allowed, especially when there is anal irritation. The general health must be attended to; and sufficient sleep must be ensured. Of prime importance is the guarding of the parts from further contamination with the infecting agent. One reads how the parts must be cleansed *after* contamination by discharge, urine, or fæces. So far as I know no authorities advise precautions to prevent sources of contamination from touching the areas they pass over. The labia and the perianal region should be freely smeared over with oil or vaseline before the passage of the urine or stools, then gently cleansed and the selected ointment substituted. For anal cleansing soap and water can be used when the part has thickened leathery ridges. Care must be taken to keep the intervening grooves clean. Paraffin preparations should be forbidden, lest leakage lead to constant reinfection and impossibility of keeping the parts clean. Hæmorrhoids must be dealt with. All sources of vaginal discharge must be stopped, either by douching, pessaries, or best of all, by ionisation of the infecting source—cervix or vagina. For young girls diathermy is on trial and promises well; it can be administered per rectum. The urine must be tested for sugar, and a catheter specimen taken to make certain there is no urinary infection. Even in *B. coli* pyelitis, however, it must be remembered that the organisms may be absent at one period of the day, abundant at another. Hence a negative report must be compared with the history and the aspect of the patient before it is accepted. The diet must be regulated according to the individual needs. In some cases tea and coffee, and in almost all cases alcohol, excess of sugar and particularly of chocolate aggravate pruritus, especially anal pruritus. Tobacco aggravates some cases. Abundance of water, fruit, and green vegetables suit the majority of patients, but not those who have spasmodic colitis. I often find that thyroid and calcium salts, when indicated, hasten the cure, especially at the menopause.

Sleep must be ensured, and this may tax all the resources of the physician. With a severe case the first week of treatment is full of anxiety; every sedative lotion and ointment may have to be tried in succession when the patient is of the doubting, nervous, uncontrolled, or sleepless type. It is essential to impress upon the patient that she must dab the applications on, never rub them in. Every scratching or rubbing throws back the cure so many days, even so many weeks. Again and again I have seen a case almost well; after a vigorous scratching when half awake the labia have swelled up to four times their size on the previous night. If irritation is unbearable tell the sufferer to press hard, and till the crisis passes hold stationary on the part either a hot or cold compress of 1 in 50 carbolic or weak solution of Jeyes' fluid or other tar preparation. No source of local friction must be permitted. Women should preferably wear open knickers. No under-linen must rub against and fray the skin or mucous membrane. Friction with the clothing is a potent cause of irritation and even of reinfection when the patient cannot carry out frequently during the day careful protection, cleansing, and local applications.

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Special Articles.

BLOOD STANDARDS.

A CRITICISM OF THE GENERALLY ACCEPTED NORMAL VALUES.

By S. C. DYKE, D.M. Oxf., M.R.C.P. Lond.,
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"In healthy males the average number of the red cells is 5,000,000 per c.mm., in females, 4500,000 per c.mm."

"In health there are five million red corpuscles (four million five hundred thousand in the female) per cubic millimetre."

THE quotations are from the latest edition of a standard text-book on the blood and from a recently published text-book on surgical pathology. The figures given above, and which have been repeated from text-book to text-book, are derived, so far as can be ascertained at this distant date, from the work of Vierordt in 1852 and Welcher in 1854. Rivers of polysyllabic terms for the same cells have poured through the publications on hæmatology since that time, but it is a tribute to the essential and solid conservatism of the minds of workers in this field that these figures, based on the examination of four subjects, should still hold the field.

The "Normal" Red Count.

Bie and Möller[1] working in Denmark, who published their results in 1922, appear to have been the first to make a serious attempt to arrive at what may be considered as a "normal" for the number of red cells in the blood of adult males of the white races. Gram and Norgaard[2] also working in Denmark, followed them a year later, but the total number of subjects investigated by these Danish workers was only 17. Osgood and Haskins[3] working in the state of Oregon, U.S.A., first dealt with the problem on an extensive scale, their results being based on the examination of the blood of 137 subjects. Osgood's results were published in 1927 and formed the basis of an annotation in THE LANCET at the time. All these workers arrived at closely similar figures, the average for all being 5,410,000 red cells per c.mm. of blood.

With a view to ascertaining whether or not residence in a hot climate is associated with any variation in the number of red cells from that found in dwellers in the temperate zone, Wintrobe and Miller[4] have recently investigated the blood of 100 males between the ages of 19 and 30 resident in New Orleans. These workers found an average figure of 5,850,000 red cells per c.mm.; this finding is in direct contradiction to the very general assumption that in members of the white races residence in a hot climate tends to produce an anæmia, this confirming the opinion of Balfour[5] that the so-called tropical anæmia is apparent rather than real. Two of the authors' subjects showed the unusually high red cell count of 7,000,000 per c.mm., a fact which tended to raise their average; taking all the figures into consideration they are inclined to doubt that residence in a hot climate has any effect on the number of red cells even in the direction shown by their data, and to regard 5,500,000 per c.mm. as constituting a reasonable "normal" for members of the white races, at any rate so far as the zone of climates included between 30 and 54 degrees of north latitude is concerned.

The "Normal" Hæmoglobin Percentage.

Most of the standard text-books on the blood remain dumb on the subject of the average amount of hæmoglobin in the blood of healthy subjects; the one referred to above gives no fewer than nine methods for the estimation of hæmoglobin percentages without affording any information as to what may be regarded as constituting 100 per cent. Makers of hæmoglobinometers for the most part likewise refrain from providing information on this important point. As Wintrobe and Miller remark:—

"it is not generally known that the Sahli instrument accepts 17·2 g., per 100 c.cm. of blood as 100 per cent., while the Dare is based on 13·8 g. as the equivalent of 100 per cent.; the Newcomer standard is 16·92 g., whereas the Tallquist scale is set on a basis of 15·8 g. This wide variation in the accepted standard is merely a reflection of the inaccurate basis on which these figures have been calculated."

In view of the fact that the hæmoglobin percentage of the blood varies with age, sex, altitude, and even, as shown by Dreyer and his co-workers,[6] with the time of day, it is obviously difficult to establish a "normal" standard, and calculations based on any such supposed normal must be accepted with due reservations. The figures of both Osgood and of Wintrobe and Miller, however, show variation about a mean somewhere in the neighbourhood of 16 g. per 100 c.cm., with averages of 15·88 and 15·87 respectively. All these workers agree that, given due consideration to the wide variations met with in healthy subjects, 15·88 g. per 100 c.cm. may be regarded as an arbitrary but convenient "normal" for the hæmoglobin of the blood of adult males. In the calculation of the colour-index, some reasonable normal standard is particularly necessary; it is obvious that very different indices will be obtained on the same blood according as to whether 13·8 or 16·92 g. of hæmoglobin per 100 c.cm. of blood be regarded as 100 per cent., and that consequently users of the Dare hæmoglobinometer will always obtain a higher colour-index than users of the Haldane or Newcomer instruments. For purposes of this calculation certain advantages attach to the use of 5,000,000 as the "normal" number of red cells per c.mm., and Osgood has suggested that this convention should be retained and that figures for the hæmoglobin should be expressed as the number of grammes per 100 c.cm. of blood calculated to a red cell count of five millions; for this figure he suggests the term "hæmoglobin coefficient." The figures for the hæmoglobin coefficient obtained by all those who have gone accurately into the matter vary between 13·34 (Bie and Möller) and 15·57 (Osgood and Haskins); the variation about the mean is in the neighbourhood of 14 and the average of all the averages 14·29. Wintrobe and Miller draw attention to the fact that before accurate colour-indices can be calculated the normal average hæmoglobin coefficient must be established, and that when established this is the figure which should be used as 100 per cent. in the various clinical hæmoglobinometers. Failing this, it is in the highest degree desirable that all hæmoglobinometers sent out from the makers for clinical use should bear in plain figures the numbers of grammes of hæmoglobin per hundred cubic centimetres of blood representing their particular 100 per cent. Workers could then make their own corrections. In the absence of these corrections misleading results may be obtained.

The "Normal" White Count.

"Normals" for the white cells of the blood are even more difficult to assess than for the red cells. It has long been known that these are subject to diurnal variations, and it was at one time supposed that these variations depended upon digestion, a belief still largely held in spite of the investigations of Sabin[7] and her co-workers and of Shaw,[8] who have shown that the ingestion of food has no effect upon the number of leucocytes in the circulating blood, but that in normal persons there is a rhythmic diurnal rise and fall in their numbers, a decrease in the early part of the day being followed by a rise as the day proceeds. Recently Smith and McDowell,[9] working at South Hadley, Massachusetts, have investigated this rhythm during the course of menstruation in normal women and have been able in the first place to confirm its independence of the ingestion of food and in the second to establish that it is unaffected by physiological menstruation. For the white cells, then, it remains impossible to establish any one figure which can be

regarded as "normal," but it is obviously necessary that in taking series of white cell counts from the same subject the specimens should be taken at the same time of day.

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SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Research in Children's Diseases.

THE research work of the Royal Glasgow Hospital for Sick Children has been well known for several years. At the annual meeting Lord Maclay, as chairman, called attention to the fact that the directors were making an appeal for a research fund of £20,000. This is a very striking departure in hospital appeals. It shows that, at last, the fundamental value of research is becoming better understood by the lay public. Dr. A. S. M. Macgregor, medical officer of health for Glasgow, strongly supported the appeal for a research fund, adding that facilities for research were the very life-blood of an institution of that kind, and that no more important investigations could be undertaken than those concerned with the biology of child life and with the prevention and treatment of children's diseases. He knew of no institution whose influence had so permeated the whole child welfare movement or whose work had so influenced current views on the prevention and treatment of the affections of childhood. On its medical side a stream of valuable contributions had been added to their knowledge of the feeding and nutrition of children, the factors which influenced growth and development, rickets, and other affections. On the surgical side the hospital was identified with the treatment of orthopædic defects and with sound schemes for better methods of prevention and treatment throughout Glasgow and the west of Scotland. He hoped that the hospital would be regarded as the centre from which the most scientific and most up-to-date information could be obtained as to the health, welfare, and treatment of infants and children under 13 years of age.

The Future of Medical Practice.

Dr. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland, in a recent address at Glasgow, said he was convinced that an improvement in the medical service depended mainly on a continued improvement in medical education. The improvement in medical education had failed to keep pace with the vast increase in medical knowledge, and it could not hope to do so until the preventive conception dominated completely the whole system of medical teaching. The artificial division between preventive and curative medicine could no longer be recognised. The treatment of one disease was the prevention of other diseases. It might be accepted that an adequate medical service would not be available until the training and work of the general practitioner and the statutory medical officer were so coördinated that the general practitioner was re-established in his position of full responsibility as family doctor, responsible for watching over the family health, responsible for the prevention of disease, and utilising for that purpose the whole of the official machinery that local authorities had provided. If this great achievement was to be realised the medical student must be so educated as to be fit for his increased responsibilities. And if he was to be properly educated the present bounds within which medicine, surgery, and midwifery were taught must be extended. The present medical training schools would have to be expanded so as to incorporate within them the great public medical services so that there should be an interlocking and interchanging of all their activities for the purposes of medical education.

VOLUNTARY AND MUNICIPAL HOSPITALS UNDER THE COMING LOCAL GOVERNMENT ACT.

REPORT BY KING EDWARD'S HOSPITAL FUND FOR LONDON.

IN January last a Special Committee was appointed by the Prince of Wales, as President of King Edward's Hospital Fund for London, to consider what steps should be taken, during and after the passing of the Local Government Bill, to maintain the existence of the voluntary hospitals as an essential part of the hospital system. This Committee, under the chairmanship of the Right Hon. J. H. Whitley, had for its members Viscount Knutsford, Sir Arthur Stanley, Sir John Rose Bradford, P.R.C.P., Sir Berkeley Moynihan, P.R.C.S., Right Hon. Hugh P. Macmillan, K.C., Sir Herbert Cohen, Sir Edward Penton, Sir Cooper Perry, M.D., and Mr. V. Warren Low, F.R.C.S. A memorandum, dated March 22nd, has now been issued [1] by the Committee dealing with the general principles of the Bill as they affect the whole country, and not specially with the problems peculiar to London.

The fundamental principle laid down in the memorandum is that there should be the maximum of efficient service for the sick and suffering. For this purpose there must be coöperation, not competition or overlapping, between the voluntary hospitals and the municipal hospitals. The Committee regard this as being essential to the full efficiency of both branches of the hospital service. They desire that the municipal hospitals should be brought to a high standard. But if this is done in such a way as to lead, directly or indirectly, to the disappearance of the voluntary element in the hospital service, this would mean in their belief the disappearance of something which is essential to the maintenance of that standard; and in the end there would not be the maximum of efficient service for the sick and suffering. The voluntary element in management and finance produces an atmosphere which, in this country at all events, is particularly favourable to hospital service. It allows, even in large institutions, the freest possible scope for the personal factor in the work of doctors, nurses, and administrators, on which the well-being of the patients largely depends. It affords the medical men, including the leaders of the profession whose services elsewhere command a remuneration proportionate to their long training and great skill, the maximum of freedom to use all their faculties, aided by the resources of the hospital, for the advancement of medical science. The lay management is in the hands of individuals, often of high capacity in their ordinary spheres, who have voluntarily undertaken it because they are personally interested in it, and who are becoming more and more representative of all classes. The work of the hospital is the sole business of the governing body. All concerned are encouraged to take a personal interest in the welfare of the patients. The hospital is in direct touch with the outside world, and has a peculiar sensitiveness to public opinion which is very valuable in connexion with the treat-

[1] Relations between Voluntary Hospitals and Municipal Hospitals under the Local Government Bill. Published for King Edward's Hospital Fund for London by Geo. Barber & Son, Ltd., 23, Furnival-street, Holborn, E.C.4. Price 3*d*. net; 4*d*. post free.

ment of the sick. As a result of all these causes, the voluntary hospitals have acquired a tradition and a prestige which, when combined with the free scope which they offer to initiative, have attracted to their service men of conspicuous ability, both medical and lay. It has been in the voluntary hospitals that the highest standard of medical and surgical work has been developed, and it has been with the standard of the voluntary hospitals before them, and with the aid of medical men trained in the atmosphere and spirit of those hospitals, that the recent improvements in many of the poor-law infirmaries have taken place. An efficient and adequate hospital service can be created, not by converting the voluntary hospitals into official institutions, but by developing municipal hospitals in coöperation with, and under the influence of, a vigorous voluntary hospital system.

Finance and Accommodation.

From the point of view of finance and accommodation, the contribution of the voluntary hospitals is also of great importance. Taking Great Britain as a whole, the number of hospitals is 930, with about 64,000 beds. The total of voluntary gifts is approximately £9,000,000, including receipts from hundreds of thousands of contributors through weekly workshop collections. Of this £9,000,000, over £6,000,000 is for annual maintenance alone, and more than £2,000,000 for capital purposes. But the destruction of the voluntary hospitals would represent the loss of far more than this: these millions would not be the only charge on public funds, because of the great amount of voluntary work, both lay and medical, which accompanies them. In the hospital service, therefore, both municipal and voluntary hospitals should be essential parts, and should be recognised as such by the public, both as ratepayers providing that part of the service which is best provided out of the rates, and as voluntary contributors providing through the voluntary hospitals those special features which depend on the maintenance of voluntary management and voluntary finance.

The memorandum goes on to make a number of practical suggestions for securing the best form of coöperation in the future. There should be continuous consultation between the authorities responsible for the rate-supported and the voluntary hospitals, respectively. This is now provided for by the new clause, introduced into the Bill in the House of Lords, which runs as follows:—

"The council of every county and county borough shall, when making provision for hospital accommodation in discharge of the functions transferred to them under this part of this Act, consult such committee or other body, if any, as they consider to represent both the governing bodies and the medical and surgical staffs of the voluntary hospitals providing services in or for the benefit of the county or county borough, as to the accommodation to be provided and as to the purposes for which it is to be used."

The Committee propose that there should be a Standing Joint Hospitals Conference in each area, composed of equal numbers of representatives of the appropriate committee of the county or county borough council and of representatives of the voluntary hospitals, including both laymen and medical men. The King's Fund is considering the best method of securing this representation in London. As regards the rest of the country, the British Hospitals Association through its regional committees is, at the suggestion of the King's Fund, taking the necessary steps. The functions of these conferences should be advisory, not executive. One of the principal functions of the joint conference would be to consider the hospital needs of the area, and the question which of these needs could best be supplied by the voluntary hospitals and which by the county hospitals.

Staffing and Equipment.

The memorandum also discusses the staffing and equipment of the two kinds of institution. It suggests that, where local circumstances permit, the municipal hospital service should be linked up with the voluntary hospital service through the appointment on the staffs of the municipal hospitals of consultants who are experienced in voluntary hospital work, so that the same spirit may influence both. On the question of the classification of patients, it suggests that great difficulties would arise if any attempt were made to lay down definite rules differentiating classes of patient, and allocating them to different kinds of institutions, either according to the nature of the ailment or according to social status, and that whatever form and degree of classification is found to be desirable will be developed in actual practice.

MEDICINE AND THE LAW.

Cockroaches in a Flat.

A LADY who was tenant of a flat at the Marble Arch succeeded in obtaining £481 damages from her neighbours on the ground of their encouragement of cockroaches on a lower floor and the consequent invasion of her premises by swarms of these unwelcome insects. She claimed that she had been unable to sleep at night, that her health had been affected, that her rooms and curtains had been damaged, that she had lost the amenities of her flat, and had suffered from the work done in the attempt to exterminate the insects and from the smell of disinfectants. Her claim included an item of £110 special damage for repairs, materials, cleaning, and medical attendance. Her medical attendant, Dr. Philip Dennis Scott, described her condition a few days before Easter, 1928. She was excited and nervous and she complained of sleeplessness owing to the presence of the cockroaches. Later he found marks on her neck which resembled bites; in the autumn she developed dermatitis and was sent to the St. John's Hospital for Diseases of the Skin. It was put to him in cross-examination that dermatitis might have been caused by the use of sulphur ointment, but this ointment, he said, was not used till the dermatitis had appeared for some weeks. Dr. William Griffith, who had attended the plaintiff at the hospital, attributed the dermatitis to the nervous upset which she had suffered. Expert evidence was given on the subject of cockroaches. The plaintiff's claim alleged that the insects were of the species known as *Blatta orientalis*. Mr. Ernest Crabbe, Fellow of the Entomological Society of London, called on behalf of the defendants, said he had been to the premises and discovered specimens of *Blatta orientalis;* he handed the judge a box of them. He did not think these insects could bite and pierce the human skin, but they ate bed-bugs. Both cockroach and bed-bug came to this country in 1583. Cockroaches, he said, were practically omnivorous; they would eat each other, organic refuse, or, preferably, sweet things. He regarded this as an "ordinary case of cockroach infestation."

The plaintiff's claim was for damages for nuisance or alternatively for negligence—nuisance in that the defendants had so used their property as to cause her substantial discomfort, negligence in that they had failed to take reasonable precautions of care and cleanliness or to appreciate the consequences of the accumulation of refuse in the café below her flat. She said the defendants were owners of the café premises while used as a café and were occupiers of those premises after they ceased to be so used. The jury's detailed answers to a series of questions framed by the judge will indicate the steps by which the plaintiff's claim was established. Did a quantity of animal or vegetable refuse remain on the café premises between certain specified dates?—Yes. Was such refuse unusual in quantity?—Yes. Did it constitute a nuisance in the circumstances?—Yes. Did the refuse cause or substantially contribute to the invasion of the flat by cockroaches?—Yes. There were other findings on the aspect of negligence, the alternative to nuisance. But the findings as to nuisance were sufficient. The question whether the refuse was unusual in quantity is significant. There was an interesting

decision in 1914 on proceedings against a market gardener from whose manure heaps came smells and flies to the detriment of his neighbours. An injunction was granted against him because, though it is usual for manure to be used in market gardening, what this particular market gardener had done was regarded by the court as something quite beyond ordinary market gardening. Similarly, it is natural that there should be some accumulation of animal and vegetable refuse in premises where the business of a café is carried on. It is the excessive or unusual accumulation which gave the plaintiff the right to damages. The café, it was explained, has now been demolished, the Regal Cinema having been erected on the site.

Appeal against a Death Sentence.

Dr. Benjamin Knowles, who until last October practised as a medical practitioner in the Bekwai district of the Gold Coast and was employed as medical officer in charge of that district, was arrested on Oct. 21st on a charge of shooting his wife with a revolver. A month later he was found guilty of murder by the Acting Circuit Judge (who tried the case without a jury) and was sentenced to death, but the sentence was commuted by the Governor of the Gold Coast. Dr. Knowles has petitioned the Judicial Committee of the Privy Council for leave to appeal against the judgment of the local court, and the Judicial Committee has granted him leave to appeal. The next stage therefore is that he will appear before the court in Downing-street in the submission of the appeal itself. The facts as stated on the recent proceedings were that Dr. and Mrs. Knowles gave a luncheon party at their bungalow on Oct. 20th at which various Government officials were present, that later (about two hours after the guests had left) Mrs. Knowles, being then in the bedroom with her husband, received a revolver wound of which she died two days afterwards in Kumasi Hospital, and that in a dying deposition she declared that the shot had been accidentally caused by her getting up out of a chair on which the revolver had been placed. The Acting Circuit Judge said he had to decide whether the firing was an accident or whether Mrs. Knowles's dying statement was a generous woman's falsehood; he described the evidence as confusing, but overwhelming, and said there could be no doubt of the guilt of the accused. Dr. Knowles's petition for leave to appeal was based on the grounds that the local court had no jurisdiction to try him without a jury, that there was no reliable evidence on which a capital conviction could safely and justly be founded, that the judge failed to give effect to the paramount rule of law that the onus of proof was on the prosecution, and finally that the case should have been referred to the local Supreme Court for trial with a jury. The tribunal before which Dr. Knowles was tried was the Chief Commissioner's court. Its procedure is governed by the Ashanti Administration Ordinance (No. 1 of 1902) whereof one clause says that no accused person may have the services of a barrister and solicitor. Another clause says that the court is to follow the procedure of the Supreme Court of the Gold Coast so far as practicable and so far as local circumstances permit. It does not appear that the judge made any statement that trial by jury was impracticable or impossible owing to local circumstances. It will be a matter for argument on the appeal whether any circumstances could bar an Englishman's right to trial by jury when accused on a capital charge and whether, if the trial was legal in view of the Ordinance, the Ordinance itself is valid. No reference was made during the recent proceedings to a subsequent Ordinance which is understood to have modified (by way of statute law revision) the wording of the Ordinance of 1902. The Privy Council was inclined to regard as meagre the information before the court. One might add, perhaps, that service in an out-district in the Gold Coast seems to be exposed to risks which strike an Englishman as strange, and that the Government does not seem to have been at any pains to assist the defence of one of its servants.

Correspondence.

"Audi alteram partem."

THE USES OF ULTRA-VIOLET LIGHT.

To the Editor of THE LANCET.

SIR,—As your leading article points out, it is a matter of medical history that though ascertained scientific facts may be the truth, they are not necessarily the whole truth. When the Medical Research Council state that "their prolonged researches . . . give no scientific reason at all to suppose that the treatment of rickets is better effected by ultra-violet rays falling on the skin than by the direct provision of the necessary food values," they are doubtless stating the truth according to their lights. But those of us who have worked at light clinics in industrial districts and who know so well the practical working conditions will be profoundly unconvinced. We remember the wretched specimens of infants with digestion impaired, unable to tolerate cod-liver oil, and the ignorant, careless, or harassed mothers who could not be depended upon to give it. We remember how often cod-liver oil failed us under those conditions, and how, on the other hand, ultra-violet light effected not only a rapid cure of rickets, but a wonderful uplift in general health. I, personally, tried dietetic and hygienic measures under these conditions in the treatment of hundreds of cases of rickets at Motherwell Child Welfare Centres from 1919 to 1924, and I freely confess that the adverse conditions proved too much for me. Success was comparatively negligible. From 1924 to 1925 I had a series of cases which had practically failed under this treatment respond rapidly to ultra-violet light. In 1925 and 1926 when the light clinic was organised I treated 121 cases to a conclusion and easily and rapidly achieved satisfactory radiographic cure in 95 per cent., as well as astonishing improvement in general health in the vast majority. Of course, I know that all this is not "scientific." But it was all that I had time and opportunity to do in that unfortunate area, and the degree of success achieved was sufficiently remarkable to satisfy all concerned.

I believe I am not by any means alone in this experience. Indeed, my observations, which might otherwise have been published in much greater detail than they have been, were anticipated by the appearance of Dr. Katherine Gamgee's book on "Artificial Light Treatment of Children" in which case-histories in rickets are given, showing precisely similar results to mine. The Medical Research Council state that reports submitted from artificial light centres "exhibit much variation of opinion," but if these reports are studied with discrimination, I believe that no appreciable difference of opinion will be found as regards (1) the rapid cure, even under adverse conditions, of the bony lesions in active rickets, and (2) the remarkable improvement obtained in general health in such cases, including such factors as improvement in muscle tone and associated activity in waking hours, the disappearance of apathy, fretfulness and sleeplessness, and the appearance of happiness and well-being.

The reports on the London children quoted by the Council deal, of course, with a different class of case altogether, but there is no clear indication of this distinction in the Council's statement. On the basis of these two limited investigations and of current laboratory findings, the Council seem prepared to condemn artificial light centres for rickets as unnecessary and about 50 times more expensive than alternative methods of treatment. In their estimate of cost they appear to have entirely overlooked the fact that many children can be treated together round the lamps, thereby making the cost per case very low. Huldschinsky, who made the great dis-

covery of the cure of rickets by ultra-violet light, stated that "a single quartz lamp rationally employed can cure annually some 1000 rickety children." But much more serious than any question of cost is the fact that the Council ignore the almost unanimous body of opinion in favour of light treatment of active rickets, expressed by clinic workers who have personal experience of it, at any rate, in the industrial districts of the north. It is a gesture which, if successful, would deprive such workers of a therapeutic armament which, in their hands, has been productive of immense benefit to child life, and such a thing at this late stage is unthinkable.

I am, Sir, yours faithfully,

H. STANLEY BANKS,
Medical Superintendent, Isolation Hospital and Sanatorium, Leicester.

March 24th, 1929.

To the Editor of THE LANCET.

SIR,—A considerable part of the report of the Medical Research Council will be endorsed by the whole medical profession. The flooding of the market with cheap ultra-violet apparatus, which is useless for therapeutic purposes, but which is capable of electrocuting the user (according to a recent inquest) in five different ways; the absurd claims made, such as the value of titanium rays, and the employment of ultra-violet in conditions in which it cannot possibly do any good, cannot be too strongly condemned. There is a good deal of the report, however, which is open to criticism.

Referring to Dr. D. Colebrook's and Dr. H. Mackay's investigations into the value of ultra-violet treatment in children and the negative results, the report states, "The Council are aware of no properly controlled experiments which have been made elsewhere to set against these two series." Sir Henry Gauvain has published such reports. He describes tests carried out in children in the same ward and therefore under identical conditions, and also tests on similar types of children but in different institutions. The Council appears to have overlooked the opinion of its other investigator, Mr. W. S. Duke-Elder. This is his opinion, after dealing with tuberculous diseases of the eye:—

> "Closely allied in its incidence and as dramatic in its response is phlyctenular keratitis. Especially does this apply to children and the typical phlyctenular child, pale, fretful, irritable, and distressed with photophobia, may be transferred into a different being in the course of a few weeks' treatment."

Why the Council should accept the work of Dr. Colebrook, which was carried out in a few months, to the opinion of Sir Henry Gauvain and Mr. Duke-Elder, whose clinical experience extends over a number of years, is not clear.

Dealing with the increased hæmobactericidal power after an erythema dose, the Council points out that the effect is transient, that it may be followed by a negative phase, and that the same effect can be obtained from a mustard plaster. On the same page Mr. Duke-Elder's work is referred to, and the conclusion is given: "Some chronic infections of the eye are said to be cleared up better than by any other method." Now, Mr. Duke-Elder's work was carried out with the fractional erythema dose technique, with the avowed object of getting this increased bactericidal power. The hæmobactericidal effect has not been confirmed by workers in England, Denmark, and Italy, and he may have been wrong in attributing the results to this effect. There can be no doubt, however, that his results were due to ultra-violet. He treated some 700 cases and they were not of the type in which "faith-healing and suggestion" could have played a part. The Council cannot have it both ways. Either Mr. Duke-Elder's results are not to be accepted or there is something in ultra-violet treatment. But it is impossible to reject his results, as his work received general commendation and his papers are second to none in the literature on ultra-violet therapy. One wonders whether mustard plasters would have given equally good results.

The Council refers to the "concordant testimony" to the value of artificial ultra-violet rays in chronic tuberculosis but do not accept it, owing to the uncertainty of changes in diet, &c. Cases have been recorded in which there were no such changes. These are ignored. The Council also hints at the possible influences of the visible rays. This is a mere quibble and is purely a technical question of which type of arc is more suitable for treatment.

The Council is on even weaker ground and has less justification for its conclusions on the value of ultra-violet rays in the treatment of local conditions, such as ulcers. After admitting that Mr. Duke-Elder, like some earlier observers, found that direct "local phototherapy" notably hastens the healing of corneal ulcers, it states that there is no equivalent evidence of the successful local treatment of skin ulcers, because Dr. Colebrook failed to heal varicose ulcers. In the first place, the varicose ulcer is not representative of all skin ulcers as there is the obvious factor of the varicose veins. Secondly, Dr. Colebrook's "intensive" inquiry was of little value. It was not an inquiry in the sense that she set out to prove whether ulcers will heal with the technique which proved successful in other hands. She set out to compare the relative merits of Unna's paste and ultra-violet, using a technique of her own. Most of her cases received such small doses that the term ultra-violet treatment cannot be applied to them. As an instance, one case received a total of about half an hour radiation in six weeks, after being ulcerated for years, and yet it was recorded as a failure. This ulcer was so extensive and chronic that she admitted, subsequently, that amputation was advised. The conception of the investigation was such, that the more chronic and consequently the more difficult the ulcer, the less often she saw it (less than once a week). Dr. Colebrook's work was criticised adversely in England and America, and this criticism was never adequately answered. But such is the touching faith of the Council in this intensive inquiry that its conclusions are preferred to the clinical experience of Stebbing, Wilson, Schiller, Bernstein, and others, including Leriche.

The Council goes out of its way to assume that the healing of the ulcers in the B.M.A. series was due to rest and not to the ultra-violet treatment, forgetting that in Dr. Colebrook's series 15 cases were treated in bed and only two healed. Five of the 15 cases received an average of five months' treatment in bed plus ultra-violet first, and bed plus Unna's paste later, and yet none of these five healed. If the assumed rest in the B.M.A. series was responsible for the healing, why did not the rest in Dr. Colebrook's series heal the ulcers? Both the rest and the ultra-violet were strikingly ineffective in the latter.

Mr. Duke-Elder can heal ulcers in the cornea: "In hypopyon ulcers it produces results more satisfactory than can be hoped for by any other method." Dr. J. G. Willmore, who is not a phototherapist, describes dysenteric ulcers which resisted all methods, but healed under the direct application of ultra-violet through the sigmoidoscope. Dr. C. B. Heald employs ultra-violet rays in the treatment of burns. The Finsen Institute treat X ray ulcers with ultra-violet. Various other types of ulcers have been published. The properties of ultra-violet which will heal the above types of ulcers should, on first principles, and in practice do, heal other skin ulcers.

The Council, no doubt, is anxious to establish ultra-violet therapy on a scientific basis, and in this should have the support of every actinotherapeutist. It is, however, to be regretted that the genuine clinical results already obtained should not have received sufficient recognition.

I am, Sir, yours faithfully,

M. WEINBREN.

London, W., March 23rd, 1929.

THE STUDY OF INDUSTRIAL HYGIENE.

DR. CAROZZI'S REPLY TO PROF. GREENWOOD.

To the Editor of THE LANCET.

SIR,—Illness has prevented me from replying sooner to the article by Dr. Greenwood on the study of industrial hygiene, published in your issue of Jan. 26th, but I hope that in spite of the delay which has occurred you will allow me to answer the rather surprising attack which he has thought fit to make on myself, although I have hitherto been a colleague of his on the Subcommittee of Industrial Cancer (Cancer Committee of the League of Nations). Whether it is in accordance with the general canons of professional courtesy to launch a personal and public attack against a colleague without any previous communication is a question on which your readers will be able to form their own opinion.

In the first place, I should like to point out that the pamphlets which the International Labour Office is publishing on industrial health do not purport to describe the conditions in the laundry or any other industry as they actually exist in any particular country. Their object is to summarise the dangers to health which have been found to exist in the various industries wherever they are carried on, in order that those concerned may take the necessary measures to guard against them. In many countries such measures have already been taken to a very large extent in the laundry industry and, as is stated in the pamphlet, "Health conditions in this industry are, in general, satisfactory as compared with other industrial work." I believe this to be generally true so far as Great Britain is concerned, but that does not remove the necessity of pointing out possible dangers, more especially for the guidance of those countries which have reached a less advanced stage in the study of industrial hygiene and the application of modern precautions. Dr. Greenwood's reference, therefore, to "indignant proprietors of laundries" and "intemperate employees who break windows in Whitehall," though no doubt amusing journalism, is quite beside the mark. No laundry proprietor need wax indignant at the contents of my pamphlet and no laundry employee need be led into intemperance, unless the conditions actually prevailing in his own establishment are such as have proved injurious in laundries in the past, but which, I hope and believe, no longer exist in any British laundry. It is not enough, however, to confine attention to cases in which "reasonably good environmental conditions" exist. The chief value of medical research is precisely to bring about the introduction of good conditions by pointing out the dangers to which their absence gives rise.

When, however, Dr. Greenwood suggests that the various diseases which I mention as having been noted in the laundry trade are derived "from uncharted wells of truth known to me alone," he only suggests his own unfamiliarity with the medical literature on the subject. In order to show this, I shall confine myself for the most part to quoting English-speaking authorities with which he might have been expected to be acquainted, and shall leave aside the statements of continental investigators, of whose works he is no doubt ignorant.

Perhaps you would allow me to deal on these lines with the various dangers which have been found in the laundry industry, but which Dr. Greenwood suggests are figments of my imagination. I can best do this by a series of quotations from some of the authorities which I used.

1. *Varicose veins, &c.*—"Much of the work in laundries is carried on in a standing position; hence varicose veins, leg ulcers, and flat-foot are quite common." (Kober and Hayhurst: "Industrial Health," p. 286, Philadelphia, 1924.)

Still more conclusive data on this subject are to be found in the report of an official inquiry entitled: "A Study of Hygienic Conditions in Steam Laundries and their Effect upon the Health of the Workers," New York State Department of Labor, 1924. The data concerning fatigue of the circulatory system have also been published separately in the *Journal of Industrial Hygiene*, November, 1924, p. 270. The inquiry in question covered 110 workers in steam laundries drawn from "some of the best as well as some of the poorer laundries." See also: "The Cost of Clean Clothes in Terms of Health," by Dr. Louis I. Harris, the Director of the Hygiene Section of the Health Department, New York, who found in an inquiry relating to 42 laundries and 3024 persons that 17·5 per cent. suffered from flat-foot. (Ref.: *Bulletin du Service Médical du Travail*, No. 2, 1920, p. 143, Bruxelles.)

2. *Eczema and skin eruptions.*—"Paræsthesia, or a peculiar tingling itching of the fingers, and also an affection of the finger nails, is occasionally observed." (Kober and Hayhurst: Op. cit., p. 287.)

"Some of the bleaching powders used are injurious to the hands of the workers. They are a frequent cause of painful cracking of the skin and of eczema." (Sir Thomas Oliver: "Diseases of Occupation," p. 387, London, 1908.)

3. "*Mycosis* of the external canal, usually *aspergillus nigricans* or *flavescens*, is found in weavers, spinners, wool sorters, and other dust workers handling oily substances as well as in persons working in a moist atmosphere, paper mill tenders, and laundry women for example. . . ." (Kober and Hayhurst: Op. cit., p. 893.)

4. The suggestion that intemperance is liable to prevail among laundry workers is not derived from my fervid imagination but is borne out by a number of authorities, in particular by an article by Miss Lucy A. E. Deane in Sir Thomas Oliver's "Dangerous Trades," pp. 671–72, London, 1902, who says of laundry work: "The work is for the most part exhausting even apart from the conditions, and the pernicious habit of quenching the thirst and stimulating an overtired physical condition with beer is common."

The same phenomenon is referred to in Sir Thomas Oliver's "Diseases of Occupation," p. 389.

Your readers will appreciate from the above quotations that though "the wells of truth" on which I have drawn may be uncharted for Dr. Greenwood, they at least spring from sources which have hitherto been recognised as authoritative in the English-speaking medical world and which will probably remain so in spite of Dr. Greenwood. They could be easily supplemented by references to well-known continental authorities, such as Margoniner, Chajes (1929), Landouzy, and others.

Dr. Greenwood then proceeds to suggest that no marked prevalence of tuberculosis has ever been observed in the laundry trade. The evidence on this subject is so considerable that it is impossible to deal with it at length. I would only refer your readers to Sir Thomas Oliver's "Diseases of Occupation," pp. 390–92, where he states that "laundry workers exhibit a greater liability to pulmonary consumption than women following other employment." He proceeds to quote evidence from an investigation made at the Clapham Infirmary of the Wandsworth Union, and from Prof. Landouzy's researches at the Hôpital Laënnec, Paris, who found that tuberculosis was "present in fully one-third of the 1200 laundresses and female ironers, and in less than one-half of the male laundry workers" treated, and that "out of 238 laundry workers who died in the hospital in five years, 143 died from phthisis." The same phenomenon was found by Dr. Margoniner, in Germany, from whom I derived the statement that the "incipient forms of tuberculosis are not uncommonly diagnosed and treated as anæmia." He states:

"The number of tuberculosis cases is very large, and as an extremely busy practitioner I could establish statistical proof of this if time allowed. The light, or rather the early, stages of lung infection showing dullness, subfebrile forms, are the most common, and are still often overlooked and treated as a species of anæmia." (Margoniner, in "Handbuch d. Arbeiterkrankheiten," Weyl, p. 429.)

Dr. Greenwood then makes play with the statistics quoted in regard to tuberculosis in British infirmaries. The "dubious origin from which these figures were taken" was Sir Thomas Oliver's "Diseases of Occupation," p. 388, and I can only suggest to Dr. Greenwood that he should turn his irony on to Sir Thomas Oliver, who will, no doubt, be quite capable of taking care of himself.

Dr. Greenwood then proceeds to give me a lecture on medico-statistical method, because I stated that in the U.S.A. the "mortality rate for tuberculosis (among laundry workers) is only 16·3 per cent. for both sexes." By wrenching the passage from its context, he attempts to give the impression that I do not understand the American figures. Had he not suppressed the remaining half of the sentence, it would have been obvious that what was meant was not the rate of mortality from tuberculosis per 100 workers, but the mortality from tuberculosis per 100 deaths. Reference to the French text of the article shows at once that I fully understood the significance of the figures. The term, "mortality-rate," tout court, has, it is true, acquired a definite meaning in English, but anybody reading the paragraph of which the offending sentence forms part will have no doubt as to the sense in which the term is here used.

I think I have said enough to show that Dr. Greenwood has allowed his zeal to discredit my work, and apparently that of the International Labour Office, to outrun his knowledge and discretion. I would only like to say once again in conclusion, that the pamphlet in question did not purport to give an account of the conditions at present existing in the British laundry industry as Dr. Greenwood seems to assume, but to summarise the dangers to health to which it has been found particularly liable, as established by the best British, American, and continental authorities on the subject.

As a result of the researches of men like Sir Thomas Oliver and Dr. Collis, great progress has been made in Great Britain during recent years, thanks to the efforts of the Home Office and the employers in the industry, to eliminate the dangers to which attention is called in my pamphlet, and I only hope that its publication may assist to bring about similar progress in other countries.

I am, Sir, yours faithfully,

L. CAROZZI.

International Labour Office, Geneva, March 7th, 1929.

CONGENITAL DISLOCATION OF THE HIP.

To the Editor of THE LANCET.

SIR,—In the leading article on this subject in your issue of March 16th reference is made to the vagaries in the geographical distribution of this congenital defect and to the difference in incidence in the two sexes. Jones and Lovett give 85 per cent. females in an analysis of 3767 cases, and Whitman, in an analysis of 500 cases, found the proportions to be 82·6 females against 17·4 males. As is stated in your article, this sex-incidence is unexplained.

I would tentatively suggest that this high proportion amongst female infants points to the existence of a sex-linked lethal factor associated with maleness, thus causing the intra-uterine death of male embryos in stocks in which this lethal factor is present and transmitted as a Mendelian recessive. Such a supposition might be invoked to explain, in part at any rate, the variations in the geographical distribution. Little and Gibbons have considered the problem of such factors in connexion with sex-linked defects, such as hæmophilia, but it would seem preferable to reserve the term "lethal" to those factors which tend to the production of non-viable offspring. Some of these factors are semi-lethal in that they do not prevent the birth of viable offspring, yet tend to the elimination of the stocks in which they are present. For these factors I suggest the term "phthersigenic," thus making use of the epithet used by Aeschylus to describe the Furies, destructive of the race of the Atreidæ.

ὦμεγαλαύκοι καὶ φθερσιγενεῖς
Κῆρες Ἐρινύες.

[*Seven against Thebes, line 1054.*

I am, Sir, yours faithfully,

Birmingham, March 22nd, 1929. G. A. AUDEN.

POST-DIPHTHERITIC AURICULAR FLUTTER.

To the Editor of THE LANCET.

SIR,—I read with much interest Dr. Patrick O'Donovan's report of his case of post-diphtheritic auricular flutter in your issue of to-day's date. Defects of conductivity are not uncommon in diphtheritic myocarditis, but I have never seen or read of another similar case. The electrocardiograms show extremely well the recovery of the myocardium, not only by the cessation of the flutter, but also by the increased amplitude of the "Q R S" complex and by the reappearance of the "T" wave in the third record (Fig. 3). The preponderance, which by the way is right-sided, tends to persist, as would be expected in a young child. I consider that the improvement in the electrocardiogram is of even greater import as regards the prognosis than is the diminution in the size of the heart.

I am, Sir, yours faithfully,

London, W., March 23rd. JENNER HOSKIN, M.D.

X RAY EXAMINATION AFTER INJURY.

To the Editor of THE LANCET.

SIR,—Last evening I saw a case of sprained ankle. I would not willingly report the case, which was not of an unusual character, were it not for advice which appeared in your issue of March 16th (p. 591)—namely, that "in any case of injury to bones or joints the doctor should *invariably* advise X ray examination" (the italics are mine).

The case was that of a lady, aged about 30, and the history was that of a fall with the left ankle bent beneath the body. First aid was rendered by a labourer, who emerged from a trench in the road, but the lady was able to walk home. She applied a well known liniment and a bandage and then went forth and posted a letter. On returning she rested until my arrival. I found some bruising beneath and in front of the lower end of the left fibula. There was tenderness over the bruised area on pressure, and more still on deep pressure. There was no tenderness over any bone, little swelling, and no limitation of movement which could not be easily overcome. From these and other considerations I formed the opinion that there had been forcible stretching and some rupturing of structures, chiefly ligamentous, on the outer side of the ankle and some effusion of blood, but that there was no injury to bone. Unless the expression "joint" is confined solely to bone, cartilage and synovial membrane, I consider that the joint was injured.

Here, then, was a case in which I had been enjoined, very many times, by the Medical Defence Union, that it was my duty to advise an X ray. Had my own interests only to be considered no difficulty would have arisen. Such apparently is the theory of medical practice which holds sway in the offices of the Union. But, in this case, both the patient and myself understood that I was attending primarily in the interest of the patient, my personal interest being confined to an expectation of legitimate fees. And the patient (this is true of 99 per cent. of my patients) was only willing to incur the expense of an X ray examination if it were my honest opinion that such examination was likely to be of value. I did not think it would be of value, nor am I willing to make X ray treatment a routine, at the bidding of the Union but at the cost of my patients, because there is just a possibility that in the case mentioned there is a concealed spiral fracture of the tibia or something equally unlikely. Indeed, circumstances would not permit me to do so, for I myself own an X ray plant and it would be presumed that my advice was not disinterested.

Nevertheless, if I am mistaken and this case is just the one in a thousand which comes into court, I shall be in an unfortunate position. I shall have acted honestly in my patient's interest, and knowing

that I considered her interest at my own peril. But I shall be confronted by a legal luminary who will be able to prove (*a*) that the Medical Defence Union is officered by persons of distinction in the scientific world or in general practice; (*b*) that these have advised that an X ray is *invariably* necessary in cases of injury to joints, and (*c*) that I have deliberately disregarded their advice. It will be of little use to argue that as a matter of practical politics X ray examination is not always necessary and that there are many cases in which no honest general practitioner would dream of putting his patient to the expense involved. It will be of little use to say that I did my best, a good average best such as is required, and with a single view to my patient's interest. For against all this will stand the damning advice of the Medical Defence Union that X ray examination is *invariably* necessary. Nor can I argue that this advice is an ethical abomination unworthy of a liberal profession, based purely on self-interest and preached from that and no other point of view. For to do so would be to advertise the dishonour of my own brethren. Yet, Sir, they *are* dishonoured by this advice as they must be by any advice which invites them to consider their own interests at the cost, if need be, of those of their patients. And their material interests are not well served by a body which prejudices all future cases by putting such a weapon in the hands of the legal representatives of our opponents.

I may perhaps say in conclusion that I bear no sort of ill-will to any officer of the Medical Defence Union, of which I am a member, but that I consider that the above views cannot be peculiar to myself and are worth considering and answering.

I am, Sir, yours faithfully,

Sevenoaks, Kent, March 21st, 1929. GORDON WARD.

GLASS-WORKERS' CATARACT.

To the Editor of THE LANCET.

SIR,—I am sorry Dr. William Robinson feels aggrieved at the omission of his name from the picturesque notice of my lecture on "Twenty Years' Experience of Compensation for Industrial Maladies." As a matter of fact, I mentioned his paper, having in mind that of Jan. 24th, 1903, in which he was the first, in this country, to describe the posterior cortical cataract of bottle finishers, and I mentioned him by name. But I was not going to deny the credit due to the careful observations, commenced in 1891, of the late Mr. A. Greenwood, the partially blind secretary of the Yorkshire Glass Bottle Makers, on cataract as a cause of superannuation of the members of his society. The subject treated in the lecture was not, who first described the condition, but how did it come to be scheduled as specific to the employment.

I am, Sir, yours faithfully,

London, March 26th, 1929. T. M. LEGGE.

BIOLOGICAL DIAGNOSIS OF PREGNANCY.

To the Editor of THE LANCET.

SIR,—The response to the letter of Prof. R. W. Johnstone concerning the Zondek-Aschheim test for pregnancy, which appeared in your columns on Feb. 9th, has been most encouraging. Already some 90 tests have been carried out and in such cases in which further clinical reports have been received the diagnosis as established by the test has been confirmed. Experience has shown, however, that the working of the pregnancy diagnosis station could be made easier and more fruitful if certain matters of detail were improved. Commonly too much, too little, or too stale urine is sent, and often in packages that are too easily broken in transit. The requirements are 2 oz. of fresh morning urine in a chemically clean bottle enclosed in a package that will withstand the dangers of the journey and accompanied by the following information: Date of last menstrual period; parity; menstrual history; history of any severe medical disturbances. It would also appear necessary to emphasise the fact that the test cannot be made free of cost; mice have to be bought and kept, and it is to cover the cost of these that a charge of 5*s.* for private cases and 1*s.* 6*d.* for institutional cases is necessary. A postal order should therefore be enclosed in the package.

I am, Sir, yours faithfully,

F. A. E. CREW.

Pregnancy Diagnosis Station, The University, King's Buildings, Edinburgh, March 23rd, 1929.

Public Health Services.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 16TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 286; scarlet fever, 2138; diphtheria, 1112; enteric fever, 40; pneumonia, 4897 (last week 5818); puerperal fever, 45; puerperal pyrexia, 117; cerebro-spinal fever, 16; acute poliomyelitis, 2; encephalitis lethargica, 21; dysentery, 13; ophthalmia neonatorum, 108. No case of cholera, plague, or typhus fever was notified during the week. The notifications of pneumonia are rapidly falling.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on March 19th–20th was as follows: Small-pox, 121 under treatment, 2 under observation; scarlet fever, 1614; diphtheria, 1842; enteric fever, 11; measles, 85; whooping-cough, 1164; puerperal fever, 19 (plus 8 babies); encephalitis lethargica, 79; poliomyelitis, 4; "other diseases," 63. At St. Margaret's Hospital there were 8 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were 2 deaths from small-pox, 4 (0) from enteric fever, 114 (0) from measles, 6 (1) from scarlet fever, 254 (81) from whooping-cough, 41 (5) from diphtheria, 59 (8) from diarrhœa and enteritis under two years, and 1552 (203) from influenza. The figures in parentheses are those for London itself.

Deaths from influenza are thus seen to be on the wane in London as well as in the country as a whole, the actual totals during the previous eight weeks for the 107 great towns being 179, 321, 652, 987, 1243, 1764, 2183, and 2127 respectively, the figures for London during the same weeks being 39, 77, 198, 331, 393, 473, 424, and 312. In the week under review, however, more than 30 deaths were attributed to influenza in the following towns—namely: Birmingham, 173; Sheffield, 89; Bradford, 56; Bristol, 49; Stoke-on-Trent, 47; Manchester, 41; Leeds, 34; Nottingham, 33. The two cases in which small-pox was mentioned as a cause of death occurred in London (Finsbury Met. B.) and Derby C.B.

The number of stillbirths registered during the week was 282 (corresponding to a rate of 39 per 1000 births), including 45 in London.

DONATIONS AND BEQUESTS.—The trustees of the estate of the late Mr. John Rankin, of Liverpool, in accordance with the testator's wishes, have allotted £95,000 to Liverpool Charities, including, besides other large donations, £7000 to the Royal Southern Hospital, Liverpool; £5000 each to the Royal Infirmary, Liverpool; David Lewis Northern Hospital, Liverpool; Incorporated Liverpool School of Tropical Medicine Appeal Fund; Liverpool Hospital for Cancer and Skin Diseases; Liverpool Maternity Hospital Building Fund; and the Liverpool College Building Fund; £3000 each to the Liverpool Queen Victoria District Nursing Association; and the Royal Liverpool Children's Hospital.

Parliamentary Intelligence.

HOUSE OF LORDS.

WEDNESDAY, MARCH 20TH.

LOCAL GOVERNMENT BILL.

THE Earl of ONSLOW (Paymaster-General) formally moved the third reading of the Local Government Bill.

Earl DE LA WARR, in moving the rejection of the Bill, said that the Scottish Bill was more generous in a great many ways. In the present Bill local authorities were to lose their right of discrimination as to whether they should seek to recover expenses for maintenance in one of their institutions. This was justified in Committee by insis ing upon uniformity with the poor-law. When, however, it was pointed out that the words in the Bill were "it shall be the duty of," and that in the poor-law the word was "may" the Government fell back upon that unfailing majority which their lordships had afforded throughout the discussion of the Bill. It was interesting to note in this connexion how far it was possible for two members of the same Cabinet to disagree and for one member of a Cabinet completely to disclaim responsibility for the opinions and actions of another member of that Cabinet. The poor-law would remain after the passage of this Bill very much the same as it was before. The old, the sick, the infirm, and the unemployed were all by this Bill left within the ambit of the poor-law; any real reform of the poor-law must separate these classes.

The LORD CHANCELLOR said the Government believed that in this Bill they had effected improvements in the efficiency of the social services, improvements in the application of public moneys for those services, and that at the same time they had remedied injustices which had too long pressed upon productive industry.

The Bill was read the third time by 70 votes to 11.

Consultation as to the Provision of Hospital Accommodation.

The Earl of ONSLOW then moved an amendment to Clause 13 to meet a point raised by Lord DONOUGHMORE, and to show that the consultation should be continuous.

The Earl of DONOUGHMORE said that the noble lord had met a real anxiety by moving the amendment.

The amendment was agreed to.

The Earl of ONSLOW moved further amendments to ensure that consultation should take place with representatives of the voluntary hospitals both as to the hospital accommodation to be provided, and as to the purposes for which it was to be used. He said that the amendments were introduced by the Government with a view to meeting Lord Dawson as far as possible. They wanted to show that they really wished to meet in every way they possibly could the wishes of noble lords who representated hospitals, and that was the object of this clause. He understood that Lord Dawson would accept it.

Lord DAWSON said he would like to express his appreciation to Lord Onslow for trying to meet the views of those who represented the hospitals as far as possible. He did not pretend that the amendment did all that they asked; but it was impossible to get all that one wanted in an imperfect world, and the new proposal certainly went further than the word "accommodation" alone. Further than that, this clause really did bring people who knew into consultation with those who had to administer. It was a beginning, but he would point out that it did not go quite as far as it would be necessary to go in administrative matters. It had always been a very serious matter that the mass of the medical profession had been divorced from having an effective voice in the health services. That did not matter very much so long as curative medicine was not concerned; but unless some steps were taken to bring the mass of the profession, and those who knew about these things, into responsible contact with those who for the first time were to take such a large part in administering the Bill, he thought the measure was unlikely to have the good effects that were hoped from it. He recognised, however, that the clause gave the right of consultation, and he hoped that out of this poor beginning larger things would grow as years went by.

The amendments were agreed to.

The Bill was passed and returned to the Commons.

HOUSE OF COMMONS.

LOCAL GOVERNMENT BILL: THE LORDS' AMENDMENTS.

On March 22nd the House considered the Lords' amendments to the Local Government Bill.

A New Clause.

Mr. CHAMBERLAIN (Minister of Health), in moving that the House do agree with the new clause providing for consultation as to the provision of hospital accommodation, said that this was a matter of some importance, and was the subject of a considerable amount of discussion in the House of Lords. The purpose of that discussion was to try to ensure that there should be full and ample opportunities for the representatives of voluntary hospitals in any area, including not merely the lay members, but also the medical and surgical staffs, to offer their experience and to put forward their views before the local authority set to work to revise its hospital accommodation. The Government did not desire to put into the Statute more than was necessary, but it became clear in the House of Lords that people of very considerable weight and standing in the voluntary hospital world were not satisfied that, without some statutory provision, there would be that measure of consultation with the representatives of the voluntary hospitals which they felt to be not merely desirable, but vital for the proper development of the hospital services of the country in the future. With the object of the amendment he had been always fully in sympathy. He had a very strong view that the assistance of the voluntary hospitals would be absolutely essential if the municipal hospitals which would be reorganised and conducted by local authorities in future were to be placed on a proper footing. They stood on a very different level from the voluntary hospitals, and it would be a work of time and of care and tact to bring them up, generally speaking, to the same level as that attained by the voluntary hospitals. That could only be done by the exercise of coöperation and goodwill on both sides. He believed that the provision made in the clause, under which there was the duty laid on the local authorities to consult with bodies representative of the voluntary hospitals, would bring about that coöperation and goodwill of which he had spoken.

It would be seen that the body which was to be consulted was such committee or other body as the local authority considered to be representative both of the governing bodies and the medical and surgical staffs of the voluntary hospitals. It would be said, perhaps, that in one area or another there would be no such body. It was quite possible that there was no such body in some areas now, but it was most desirable that there should be such a body, because the voluntary hospitals would never be able to exercise to the full the influence which they should do on the health of the district unless there was coördination among themselves, and unless there was some body which would represent the various voluntary hospitals concerned, and which could speak for the whole of them when dealing with the local authority. Without such a body there would not be the full measure of consultation which was desirable. He regarded the clause, therefore, as one which was likely to have the effect of stimulating the formation of such representative bodies, and from that point of view also he believed it to be a valuable addition to the Bill.

Mr. GREENWOOD said that it was quite clear that if they were to make the best use of the available hospital accommodation there must be consultation between the local authorities and the various voluntary hospitals. But he looked on the new clause with a little suspicion. The Minister of Health seemed to have in hand the organisation of the new voluntary hospitals in the future with a view to preventing the development of the public hospitals. He (Mr. Greenwood) saw no reason why the consultation proposed should not have been confined to the governing committees of the hospitals. Had the Conservative party now turned to Syndicalism? Why should the local authorities have to consult the employees of the voluntary hospitals? The words of the new clause had been put in by the most powerful trade-union in the country. They were initiated and supported by very influential members of the medical trade-union.

Lieut.-Colonel FREMANTLE: What does the hon. gentleman mean by that? Does he mean the British Medical Association?

Mr. GREENWOOD: I mean the organised medical profession of this country.

Lieut.-Colonel FREMANTLE: Which organisation does he mean?

Mr. GREENWOOD: There are more than one, I understand. I see no reason why the hon. gentleman should be ashamed of his trade-union.

Lieut.-Colonel FREMANTLE: I am not ashamed of it, but I want the hon. gentleman to be precise in what he says. (Laughter.)

Mr. GREENWOOD: To please the hon. gentleman I will say at once, the British Medical Association.

Lieut.-Colonel FREMANTLE: May I ask if Lord Dawson has anything to do with the British Medical Association? (Cheers.)

Mr. GREENWOOD: I should think it very unlikely, but no doubt he is a loyal paying member of his trade-union

and is in a position to present its case in the House of Lords. Continuing, Mr. Greenwood asked why it should be made compulsory on the local authorities to consult with the servants of the voluntary hospitals? He was sorry the Minister of Health had lent himself to this new development of Sovietism in a very conservative profession. It looked as if there might be behind this proposal opposition to any development which did not harmonise with their own particular interests.

Sir R. LUCE welcomed the new clause. Some sort of coördination, he said, was essential in the future between the voluntary system and the development of hospitals under the local authorities if a great deal of overlapping was to be prevented. A vast amount of experience had been gained by the voluntary hospitals, not only in the matter of administration, but in matters affecting the coördination of hospital work. There was need for the separation of different kinds of treatment and a vast amount of work was necessary in reorganising and coördinating in order to see that the right kind of work was done in the hospitals throughout the country. That was a matter on which medical advice was necessary. Therefore it was a little unfair to say that the medical profession should not be consulted in this matter. He welcomed the clause very heartily on behalf of those interested in the development of the hospital system and in ensuring that in any future extension of it the wonderful old system of voluntary hospitals should not be elbowed out by processes of nature, but that it should remain the centre round which the new development of hospitals should proceed. They owed to Lord Dawson, who so eloquently and persistently urged the adoption of a clause of this kind, another debt of gratitude in addition to the great debt which the nation owed to him to-day and would never be able to repay him.

Mr. PETHICK-LAWRENCE said that the Minister had given no indication of what the local authority would do in cases where no such committee as was contemplated by the clause existed. There was no obligation on the part of the voluntary hospitals to form such a committee.

Sir A. HOPKINSON said that he had had to deal with just such questions as were raised by the clause, which was an admirable one, and he believed that coördination was absolutely vital in hospital work and development. It was necessary that the medical staff should be consulted, for they were the people who really understood the points in question. In the coördination of hospital work in Manchester he knew that the loyal coöperation of the medical men who had given their lives to this work had been of the utmost value. How could they possibly know what steps ought to be taken, not only in the matter of healing, but of research, unless they consulted the people who had been at work for years in connexion with the various hospitals? There was also the question of the training of medical men and nurses. On that point, after many years' experience, he had come to the conclusion that coöperation between the laymen on the governing bodies, the local authority, and the trained medical men was vitally essential.

Sir H. NIELD said that as one who had been interested in voluntary hospitals for many years he thought that the attitude of the Labour party, who pretended to be the friends of the poor, on this matter was a very ungenerous one. He hoped that they would not hear any more of the ungenerous attacks on the medical profession, who had devoted their lives to the welfare of the public.

Sir H. SLESSER denied that anyone on the Opposition side of the House had attacked the medical profession. They all agreed in paying to the doctors the greatest possible tribute, and the question of the merits or demerits of the doctors, or anybody else, had nothing to do with the matter under discussion. The direction on the clause that the local authorities should consult with certain bodies was only a pious aspiration, for even if these bodies existed and consultations took place nothing was provided as to the consultations being acted upon. The clause could not be interpreted in a court of law, and was meaningless.

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) said that in the House of Lords many most distinguished lawyers and judges who sat on the highest tribunal in the land had devoted considerable time to the discussion and framing of this clause, and he accepted their view that it was likely to have real and practical effect. The object of the clause was to avoid overlapping in the provision of hospital treatment, and he was certain that when the local authorities entered into consultation with the representatives of the voluntary hospitals that that consultation would be of the friendliest nature. He did not believe that these would be empty consultations, but that they would be really in the best interests of the poor and the sick of the country. A very large number of associations representative of the voluntary hospitals already existed in many areas, and where no such associations or committees existed at present the Minister of Health was assured that the voluntary hospitals would see that they were formed. It was obviously to their interests to secure that. The local authorities and the bodies representing the voluntary hospitals could be trusted generally to consult in this matter in a friendly way and to come to a conclusion which would be to the best interests of all concerned.

The new clause was agreed to.

Weekly Contributions to Hospitals.

A further amendment inserted in the House of Lords legalising the practice of associations of wage-earners and persons in receipt of small incomes to contribute weekly sums for the support of poor-law hospitals as well as voluntary hospitals, was agreed to.

Mr. CHAMBERLAIN, in moving that the amendment should be adopted, said that in one case last year nearly £10,000 was paid to the guardians for services rendered by a poor-law hospital.

The remaining amendments were mostly of a drafting character.

WEDNESDAY, MARCH 20TH.

PUBLIC HEALTH IN SCOTLAND.

On the motion for the second reading of the Consolidated Fund (No. 2) Bill a debate took place on Scottish affairs.

Sir ARCHIBALD SINCLAIR raised the question of agricultural research. He said the work which had been pushed forward in that direction during the last few years was resulting in discoveries which would undoubtedly affect the health of future generations. He had in mind particularly the very important research into milk consumption and its effect upon school-children which he hoped would be used by this Government, and future Governments, to bring home to the people the physical advantages of milk consumption and its advantages in conferring upon the youth of the country greater mental energy as had been proved by this research.

Mr. JAMES STEWART urged that something should be done to prevent sewage being poured into the River Clyde by certain local authorities in the Glasgow area. This sewage he said, was endangering the health of the whole community in that region. But the Scottish Board of Health, instead of supporting Glasgow in the matter, had practically said that they could do nothing.

Puerperal Fever.

Turning to the general question of public health the hon. Member said that puerperal fever was still taking as large a toll of life as it did 40 years ago. Apparently science which had reduced the death-rate in other directions had failed in regard to this disease. He would like to know what action the Government were taking in the matter. It might be necessary for the central authority which was finding the money to use some sort of forceful persuasion on the local authorities to induce them to develop their maternity hospital accommodation. It should be possible for every woman at the time of childbirth to have the chance of the best accommodation and treatment. It should not be possible for these women to remain at such a time in the fœtid atmosphere of single-apartment houses in the big cities and in places where the hygienic conditions could not be made suitable. He gathered from the Report of the Scottish Board of Health for 1927 that instead of the cases of pulmonary tuberculosis showing a reduction in that year there was an increase. It was true that the ground which was lost in regard to pulmonary tuberculosis was balanced by ground gained in other respects, but while they had made great progress he would like to know more about what was being done. He believed that they had gone as far in this matter as they were likely to do until the conditions of the people were improved. There was not a medical officer in Scotland who, when lecturing on this subject, did not say something about it being a disease due to poverty, and that its main cause was not merely bad housing, but other bad conditions of almost equal importance.

The Minister's Reply.

Sir J. GILMOUR (Secretary for Scotland) said that he had come to the conclusion that the sewage referred to by Mr. Stewart would be sufficiently aerated and broken up to enable it to be discharged into the Clyde in such a condition that it would not be deleterious or offensive. The matter, however, would be most carefully watched by the Department. He regretted that greater progress had not been made in dealing with the very serious problem of puerperal fever, but they had taken steps to ensure that in future on every death certificate these facts should be notified, and that in itself would be an advance in giving them information which could be tabulated. He would also draw attention to a report by Dr. Kinloch, the new head of the Health Department in Scotland, who spoke with peculiar knowledge on this subject. They desired to draw the attention of the whole medical fraternity to his report which would be made available. He hoped by the steps taken recently in the Scottish Local Government Bill that they would make further progress in regard to the increase of hospital accommodation.

As to the problem of tuberculosis they had made some progress. The rate had fallen from 99 per 100,000 to 97 per 100,000. That, of course, had been mostly in the pulmonary type of tuberculosis. In that alone it had fallen from 71 per 100,000 in 1927 to 68 in 1928. They had the highest number of beds in the hospitals of local authorities that they had ever had—4634—and hospitals had been opened in the Shetlands. Something like £600,000 per annum was being spent by local authorities.

The Bill was read a second time.

Administration of Powerful Drugs.

Sir ROBERT THOMAS asked the Minister of Health whether hospital probationers were entitled to administer powerful drugs, such as digitalin and morphia, in the absence of a qualified medical practitioner; and who was held responsible in the event of the death of a patient as a result of a mistake on the part of a probationer.—Mr. CHAMBERLAIN replied: The answer to the first part of the question is that while the administration of drugs within the scope of the Dangerous Drugs Acts is subject to special restrictions, the responsibility for administration rests with the medical practitioner in charge of the case. I cannot undertake to pronounce the general terms upon the issue raised by the second part of the question, which must turn upon the view taken of particular facts.

Sick Leave among Women Clerical Officers.

Mr. TOWNEND asked the Secretary of State for Foreign Affairs what was the average number of days of sick leave per head during each of the last three years in the case of women clerical workers, writing assistants, and members of the established typing grades, respectively, employed in his department; and what was the average number of days of sick leave per head in the case of each of the grades concerned, taken on account of gastric or nervous trouble respectively.—Sir AUSTEN CHAMBERLAIN replied: The following is the information asked for:—

—	Average number of days' sick leave per head.		
	1926.	1927.	1928.
Women clerical officers ..	7·8	5·8	7·7 (*a*)
Writing assistants	1·5	2·5	1·0
Established typing staff ..	9·0 (*b*)	9·8	7·8 (*c*)

(*a*) Excluding two women who had 86 and 145 days' sick leave respectively.
(*b*) Excluding two women who had 108 and 121 days' sick leave respectively.
(*c*) Excluding one woman who had 204 days' sick leave.

To furnish the information requested in the last paragraph of the question would involve the scrutiny of a large number of medical certificates, and I do not think that the labour involved would be justified.

THURSDAY, MARCH 21ST.

The Lead Paint Regulations.

Mr. VIANT asked the Home Secretary whether he could indicate generally the results of the working of the Lead Paint Act, 1926; and whether he would consider the propriety of ratifying the international convention of 1921 with regard to white lead.—Sir WILLIAM JOYNSON-HICKS replied: Reports recently received indicate that as a result of the coöperation between the inspectors and the industry, substantial progress has been made in compliance with the Act and Regulations, but as the Regulations only came into operation on Oct. 1st, 1927, and have therefore been in force for less than 18 months, it is not possible yet to form any reliable estimate as to their efficiency. The Act was passed on the understanding that before prohibition was resorted to, the effect of regulations should be tried, and I am not therefore prepared to re-open this question at present.

The London Lock Hospital.

Mr. PETHICK-LAWRENCE asked the Minister of Health (1) whether he was aware that there was dissatisfaction at his declared intention to refrain for the present from publishing the report of the committee which inquired into the London Lock Hospital; and whether he had set a time-limit to the board within which the reforms promised by them must be carried out; and (2) whether he would publish the correspondence between himself and the board of the London Lock Hospital, including the letter or memorandum from the board on the strength of which he had decided to refrain for the present from publishing the report of the Committee of Inquiry.—Mr. CHAMBERLAIN replied: I have no evidence of dissatisfaction with the reply which I gave on this matter last week. I have, as I then stated, made myself responsible for ensuring that changes at the hospital are made with sufficient speed; but it is not practicable to impose a time-limit in affairs of this kind. I cannot undertake to publish the correspondence alluded to in the hon. Member's second question.

Small-pox in London.

Mr. DAY asked the Minister of Health the number of small-pox cases notified in the London area during the past three weeks; the districts from which these cases had been reported; and the number of adults amongst such cases.—Mr. CHAMBERLAIN replied: The total number of cases of small-pox notified in the metropolitan boroughs of the Administrative County of London during the three weeks ended March 16th, 1929, was 39—viz.:—

Notified during three weeks ended March 16th.	Cases of small-pox.*	Notified during three weeks ended March 16th.	Cases of small-pox.*
Bethnal Green ..	2	Poplar ..	9
Finsbury ..	4	St. Pancras ..	2
Holborn ..	1	Southwark ..	3
Islington ..	1	Stepney ..	13
Lambeth ..	4		

*Provisional figures.

He understood that 15 of these notifications were in respect of persons of the age of 21 years or over.

Accidents in Factories and Workshops.

Sir WILLIAM EDGE asked the Home Secretary the number of accidents to workpeople in factories and workshops in England and Wales in 1928; the number of fatalities; and whether he was satisfied that adequate progress was being made with the safety-first arrangements.—Sir W. JOYNSON-HICKS replied: The number of accidents, as provisionally ascertained, was 126,366, of which 578 were fatal. As regards the second part of the question, I am glad to say that the action which was taken last autumn, in response to my representations, by a number of important employers' associations, has had good results and that substantial progress is being made in the industries chiefly concerned. A great deal, of course, remains to be done, and there are still many works where no adequate arrangements have yet been set up, but the outlook is distinctly encouraging, and I hope for a much fuller and wider development of this movement in the near future.

Sanitary Arrangements on British Transport.

Mr. THURTLE asked the Secretary of War if he would cause inquiries to be made into the conditions in which troops recently returned to this country from China on board the S.S. *Neuralia*, particularly in regard to the lack of space for sleeping and exercise purposes and the inadequacy of the sanitary arrangements.—Sir L. WORTHINGTON-EVANS replied: The S.S. *Neuralia* is a hired Government transport fitted by the Board of Trade in accordance with the regulations approved for the conveyance of troops by sea. I am informed that the numbers embarked were normal, and that there are no grounds for the suggestion that there was any lack of space for exercise or sleeping or that the sanitary arrangements were inadequate.

MONDAY, MARCH 25TH.

Lepers in India.

Sir ROBERT THOMAS asked the Under Secretary of State for India if he could state approximately the present number of lepers in India; how many treatment centres were now open; to what extent those centres were State supported as regarded initial establishment, maintenance, and payment of their medical staffs; and whether the British Empire Leprosy Relief Association received any financial aid from public funds.—Earl WINTERTON replied: The number of persons in India returned as lepers at the census of 1921, the last official figures available, was 102,513, but it is probable that the number of lepers in India is considerably in excess of that returned. Information is not available as to the number of treatment centres now open in India. With regard to the remainder of the question, as public health is a transferred provincial subject, the matter is one for the local governments and legislative councils. The Indian Council of the British Empire Leprosy Relief Association work in coöperation with the provincial governments and voluntary agencies, and in each province the local governments either support the leper institutions or make a capitation grant to the institutions under the administration of the Mission to Lepers.

Sir R. THOMAS asked if the hon. gentleman was aware that there were more lepers under the British flag than under any other flag?

Earl WINTERTON: I think that is exceedingly probable in view of the fact that one-third of the population of the world is under the British flag.

Mr. DAY asked whether the latest remedy discovered for the cure of leprosy was not greatly alleviating the disease?

Earl WINTERTON: Yes, Sir, I believe that is so. My noble friend has a very distinguished medical adviser at the India Office who is very closely associated with that particular remedy.

Report on Radium Supplies.

Lieut.-Commander KENWORTHY asked the Minister of Health whether he had received the report of the sub-committee of the Committee of Civil Research on radium and radium supplies; and whether it was proposed to publish it in whole or in part.—Sir KINGSLEY WOOD replied: The report has been received and will be published in full very shortly. I may add that a statement of the intentions of the Government in the matter will be made immediately on the reassembling of Parliament.

Cardigan Cure for Cancer.

Viscount SANDON asked the Minister of Health whether his department or the Committee of Medical Research had investigated the Cardigan alleged cure for cancer; and, if so, what was the report thereon.—Sir KINGSLEY WOOD replied: This is one of several alleged cancer cures regarding which my right hon. friend has made some inquiries through the Departmental Committee on Cancer. No information of scientific value was obtained by those inquiries and no report dealing with the cure has been made.

Medical Officers' Accommodation on China Station.

Sir RICHARD LUCE asked the First Lord of the Admiralty if he was aware that in three of the destroyers serving on the China station the medical officers had been obliged to see their patients and keep their medical stores in part of the latrine accommodation of the ships; that the same medical officers unable, owing to lack of accommodation, to obtain cabins, had been refused hard-lying or other allowance in compensation for their discomfort; and if he would inquire into the matter.—Lieut.-Colonel HEADLAM (Parliamentary Secretary to the Admiralty) replied: No, Sir. There is no information at the Admiralty which would support the allegation in the first part of the question. From such reports as are available it is clear that the best arrangements possible have been made to provide emergency accommodation for the additional medical officers whom it was found necessary to appoint to the destroyer flotillas in China. The only application received for the payment of hard-lying money was in 1927. This was refused as the conditions which were represented to exist were not such as to justify the grant of extra pay.

Sir R. LUCE asked if hard-lying money was not instituted for this purpose?

Lieut.-Colonel HEADLAM replied that hard-lying money was not ordinarily payable to officers in destroyers, and the abnormal conditions were not regarded as sufficient to justify a grant of extra pay.

Sir R. LUCE asked if it was not a fact that this extra work had been going on for some considerable time?

Lieut.-Colonel HEADLAM said that he could not answer that question.

Rheumatism among Children.

Brigadier-General WRIGHT asked the Minister of Health if he could state the extra provision of hospital accommodation set aside in the last 12 months for the treatment of acute rheumatism among children; and what was the total number of beds so set aside.—Mr. CHAMBERLAIN replied: No complete particulars are available, but as regards London, the Metropolitan Asylums Board have during 1928 set aside 38 additional beds in their institutions for the treatment of rheumatic affections among children (including rheumatic fever, acute endocarditis, and chorea). The total number of beds provided by the Board for this purpose was 170 at the beginning of the present month, and they are providing 350 additional beds in buildings now in course of construction. Accommodation is also provided for children suffering from rheumatism in other hospitals, institutions, and schools for physically defective children recognised by the Board of Education, but the exact particulars as to the number of beds so provided are not available. I may, however, refer my hon. and gallant friend to the information given on page 65 of the report of the Chief Medical Officer of the Board of Education for the year 1926, and to pages 123 and 124 of the report for the year 1927. Reference may also be made to page 211 of the report of the Chief Medical Officer of my department for the year 1927.

Insured Persons and Rheumatism.

Brigadier-General WRIGHT asked the Minister of Health if he would state exactly what treatment could be obtained under the National Health Insurance Acts by persons suffering from different forms of rheumatism.—Mr. CHAMBERLAIN replied: All insured persons in Great Britain (with the almost negligible exception of voluntary contributors with an income exceeding £250 a year) are entitled to medical benefit. Under this benefit insured persons suffering from any form of rheumatism are entitled to receive from insurance practitioners all such treatment as the practitioners consider to be proper and necessary, except treatment involving the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess. Further, if an insured person who is a member of an approved society which has adopted additional benefit No. 10 receives treatment as an in-patient of a hospital, the society may make payment towards the cost of his maintenance and treatment. Finally, as soon as suitable arrangements can be made under additional benefits Nos. 8 and 16, it will be open to societies which adopt these benefits to make payment towards the cost of any special form of treatment of rheumatism (not included under either of the heads referred to above) either by a registered medical practitioner in accordance with an approved special scheme, or through the agency of an approved charitable institution.

Milk-supply Grants.

Sir WILLIAM EDGE asked the Minister of Health the total of the milk-supply grants to local authorities in England in each year since the grants started.—Mr. CHAMBERLAIN replied: The grants for this purpose are included in the total grants paid to local authorities in respect of their maternity and child welfare services, and no separate figures are available showing the actual amount of grants paid for the supply of milk. The closest estimate which can be formed of the total grants paid for this purpose in respect of each of the financial years 1919–20 to 1927–28 is given in the following statement: 1919–20, £80,000; 1920–21, £179,500; 1921–22, £140,500; 1922–23, £103,500; 1923–24, £95,500; 1924–25, £91,000; 1925–26, £93,500; 1926–27, £103,000; 1927–28, £98,000.

Deaths at Oldchurch Hospital, Romford.

Mr. MARCH asked the Minister of Health whether he had had his attention called to a report by the medical superintendent of the Oldchurch Hospital, Romford, that nearly 100 deaths occurred there within three weeks, and that many of the lives might have been saved if it was not for the overcrowding; that the Romford Board of Guardians was waiting for the sanction of the Minister to enlarge the accommodation, but no approval had been received: and if he could state the cause of the delay and what he was doing in the matter.—Mr. CHAMBERLAIN replied: I have seen a report by this officer in which he states that some of these deaths which apparently occurred last month could have been avoided had the guardians taken some notice of his repeated advice with regard to the lack of accommodation. Proposals for the provision of increased accommodation for cases of tuberculosis were submitted by the guardians in August of last year. After consultation with the Essex County Council I came to the conclusion that the provision of additional wards of the ordinary hospital type was necessary, and the guardians themselves adopted this view in a letter addressed to me on Jan. 14th last, when they made proposals for extensions at an estimated cost of £33,000. On Jan. 18th I informed the guardians that I was prepared to consider the provision of additional hospital wards, and on the 22nd inst. a deputation of the guardians was seen by my officers. No detailed proposals had been submitted to me before the interview, but arrangements have now been made for the immediate discussion of the necessary plans between the guardians' advisers and my officers. There has been no delay on my part in dealing with any proposals of the guardians.

Nightwork in Bakeries.

Mr. KELLY asked the Home Secretary whether he was aware that the international convention on prohibition of nightwork in bakeries was still awaiting ratification: and what action he proposed to take.—Sir W. JOYNSON-HICKS replied: The question of ratifying this Convention was fully considered by the Government, and their decision not to ratify was communicated to this House in April, 1926. Briefly, the reasons were that the provisions of the Convention went much beyond the recommendations of the Departmental Committee on the subject, and were too drastic. In particular, objection was taken to the prohibition being applied not only to the operative baker but also to the master-baker himself. Moreover, it appeared from a report by the Royal Commission on Food Prices that the effect of prohibition, if the supply of bread was to be continued as at present, would be to increase the cost of the loaf. These objections still hold good, and I see no grounds for reconsidering the previous decision.

Sick Leave among Women Clerical Officers.

Mr. TOWNEND asked the President of the Board of Trade the average number of days of sick leave per head during each of the last three years in the case of women clerical officers, writing assistants, and members of the established typing grades respectively, employed in his department.—Mr. HERBERT G. WILLIAMS replied: The following table gives the information for which the hon. Member asks in the first part of the question:—

—	Average number of days sick leave per head.		
	1926	1927	1928
Women Clerical Officers	8·0(*a*)	8·3	4·3
Writing Assistants	6·4	7·1	4·5
Established typing grades	7·8	7·0(*b*)	5·2(*c*)

(*a*) Excluding two women who had 155 days sick leave each.
(*b*) Excluding 4 women who had 303, 231, 105, and 101 days sick leave respectively.
(*c*) Excluding 4 women who had 122, 109, 104, and 88 days sick leave respectively.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. G. Nunn is placed on Retd. List with the rank of Surg. Capt.

The following appointments are announced: Surg.-Comdr. A. S. Patterson to *Pembroke*. Surg. Lts. H. E. M. Martin to *Harebell*, and J. G. Holmes to *Malabar*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. D. A. Imrie to be Surg. Lt.-Comdr.
Proby. Surg. Sub-Lt. A. Elliott to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. J. E. Hoar, Reg. Army Res. of Off., is re-empld. under Art. 507 (*b*), Royal Warrant for Pay and Promotion, 1926.

TERRITORIAL ARMY.

Maj. G. H. R. Gibson to be Lt.-Col. and to comd. the 155th (Lowland) Field Amb.

Maj. J. Ramsay, from T.A. Res. of Off., to be Maj.

Capt. H. H. L. Ellison resigns his commn. and retains his rank.

Lt. J. O. Moffat to be Capt.

ROYAL AIR FORCE.

Group Capt. C. E. C. Stanford is placed on the retd. list.

INDIAN MEDICAL SERVICE.

The Secretary of State for India, in Council, has appointed the undermentioned to permanent commissions in His Majesty's Indian Medical Service: Kenneth Field Alford, Hubert Joseph Curran, Alan Mackenzie Fraser, Brynmor Jones Griffiths, William Parsons Lappin, Eric Alva Ynyr Mackeown, Hugh Thomas McWilliams, George Milne, George Joseph O'Connor, Peter Shannon, David Leo Trant, Harry Silvester Waters, Edward Patrick Walsh, and William James Walsh. Further appointments are about to be made, and young medical men contemplating a medical career in India are referred to the announcement in our advertisement pages.

UNIVERSITY OF ST. ANDREWS.—Arrangements have now been completed for incorporating in the University the Dental School, hitherto carried on in Dundee under the auspices of the directors of the Dundee Dental Hospital and the Council of the Dundee Dental School. Grants have been promised by the Dental Board of the United Kingdom towards the enlargement of the Dental Hospital and the supplementing of its equipment, and towards the remuneration of lecturers in dental subjects. The lectures and part of the practical work will be carried on in the buildings of the Medical School of the University and University College, Dundee, and extended facilities will be provided in the Dental Hospital for clinical instruction in the several branches of the work of dental practitioners.

Medical News.

UNIVERSITY OF LEEDS.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—Bessie Brown, W. H. Craven, H. Denton, C. H. Foster, J. F. Galpine, W. L. Hardman, J. N. Hill, G. M. Holliday, L. Hoyle, Eugenie C. Illingworth, I. J. Keidan, R. G. S. Meadley, C. Poniedel, L. J. Richmond, S. Rosenberg, S. Silman, L. Silverman, W. E. Smart, E. J. Wayne, and J. W. Whitworth.
Part II.—J. Kak, J. Loofe, and G. J. Marks.
Part III.—L. B. Flather, Esther M. Killick (with distinction in Medicine), A. C. Shuttleworth, and Ivy R. Watson.

FINAL EXAMINATION FOR L.D.S.

Part I.—W. Firth and P. W. Thornton.

UNIVERSITY OF MANCHESTER.—At recent examinations the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH.

Part II.—Andrew Anderson, Helen G. M. Bennett, Mary Evans, J. J. O'Reilly, Mary I. Prentice, Marjorie Reekie, and Kathleen Sheehan.

UNIVERSITY OF LIVERPOOL.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B. AND CH.B.

Parts I. and II.—V. T. Parkinson.
Part II.—Teresa Lightbound.

DIPLOMA IN PUBLIC HEALTH.

Part I.—A. B. Anderson, J. L. Glegg, Kathleen Edgecombe, R. R. Evans, Bridget M. O. Gordon, B. S. Jarvis, I. S. Jones, J. S. Logan, J. Macdonald, J. C. MacFarland, R. L. McMorris, E. Miles, R. J. Ormsby, D. E. P. Pritchard, F. L. Smith, and F. C. Speechly.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

Parts I. and II.—W. H. Milligan, J. E. C. Walker, P. H. Whitaker, and J. Wilson.

DIPLOMA IN TROPICAL MEDICINE.

K. B. Chakravarti, J. Crawford, W. C. Dale, J. R. Dogra, G. D. Drury, T. S. Gill, Margaret Al. Herbertson, J. A. L. Innes, J. A. McGregor, W. B. McQueen, B. K. Majumdar, I. C. Middleton, J. T. F. Pearse, C. Ramdeholl, Elizabeth J. Robinson, P. B. Robinson, A. Shafi, T. Verghese, and S. P. Wilson.

DIPLOMA IN TROPICAL HYGIENE.

S. W. H. Askari, A. Halawani, I. S. Hilmy, H. S. Lawrence, and H. M. Setna.

UNIVERSITY OF DUBLIN: *Trinity College.*—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Part I. Therapeutics, Pathology, &c.—*S. Moore, *Samuel Levy, William Caldwell, F. M. Lyons, and (in completion) C. H. Hutchinson and A. A. Lisney.
Part II. Medicine.—A. F. Kennedy, L. B. Harris, F. R. Falkiner, T. B. McMahon, John Beggs, P. A. Thornton, E. V. Hicks, Nathan Shapira, E. B. Solomons, G. B. Thrift, R. M. Wilson, M. E. Kirwan, N. S. Klass, M. H. Fridjhon, J. A. Dowds, Cecil King, and N. H. Lindsay.
Surgery.—J. E. C. Cherry, Nathaniel Burstein, P. A. Thornton, Anna M. E. McCabe, Hyman Dundon, W. B. Hamilton, W. A. Y. Knight, and Josephine M. Enright.
Midwifery.—*J. N. U. Russell, *E. F. St. J. Lyburn, H. T. Fleming, Patrick O'Shea, R. E. Hemphill, Lilla M. Spiller, E. F. S. Morrison, G. R. Beare, Arnold Rose, Kathleen A. Wilson, Samuel Beggs, Dora G. Bradley, R. T. O'Shea, R. P. McGarrigle, Frances E. Wilson, Nathan Shapira, John Willoughby, and E. J. M. Bam.
* Passed on high marks.

F. J. P. McCarthy has passed the Final Examination in dental surgery and associated subjects for the B. Dent. Sc., and I. S. Marwah the examination for the Diploma in Gynæcology and Obstetrics.

Lord Dawson has been appointed a member of the General Council of King Edward's Hospital Fund for London.

NAVAL MEDICAL COMPASSIONATE FUND.—A meeting of the subscribers of this Fund will be held at 11.30 A.M. on April 25th at the Medical Department of the Navy, Queen Anne's Chambers, Tothill-street, Westminster, S.W.1, to elect six directors of the Fund.

THE Standing Committee of the Universities Bureau of the British Empire have recorded their sorrow for the death of Dr. Alex Hill, secretary of the Bureau, referring to the "attractive personal qualities of modesty, diligence, unselfishness, and geniality of temper" which "endeared him to his colleagues and ensured the smooth and happy working of the machinery he did much to create and develop."

Sir Robert Armstrong-Jones has been appointed Sheriff for Carnarvonshire.

UNIVERSITY OF OXFORD.—Dr. O. A. Beadle has been elected to a Radcliffe Travelling Fellowship and Dr. S. C. Dyke has been awarded the Radcliffe Prize for the furtherance of medical science.

UNIVERSITY OF LONDON.—At a meeting of the Senate on March 20th it was resolved to institute an academic diploma in Public Health.

Mr. Harold Raistrick, D.Sc., was appointed as from August 1st, 1929, to the University Chair of Biochemistry tenable at the London School of Hygiene and Tropical Medicine, where he will also hold the position of Director of the Division of Biochemistry and Chemistry as applied to Hygiene.

From 1915–20 Dr. Raistrick was engaged on research work on the biochemistry of micro-organisms for the Medical Research Committee in Sir Frederick Hopkins's Laboratory at Cambridge. Since 1921 he has been on the research staff of Messrs. Nobel's Explosives Company, Ayrshire, where he has organised and equipped a new biochemical research department.

The degree of D.Sc. in Anatomy was conferred on Mr. W. B. Crow for a thesis entitled Contributions to the Principles of Morphology.

LONDON HOSPITAL MEDICAL COLLEGE. — The Hutchinson Triennial Prize, of the value of £60, will next be awarded in 1932, for a dissertation on the Remote Consequences of Fracture of the Spinal Column. A candidate is eligible to compete until ten years after registration as a student of the hospital.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The courses to take place after Easter are: A fortnight's course for practitioners at the London Temperance Hospital, in medicine, surgery, and the specialties, from 4 to 5.30 P.M. daily, beginning on April 8th; a series of eight lecture-demonstrations at the London School of Tropical Medicine on Tuesdays and Fridays from April 9th; a course of four lecture-demonstrations on light and heat therapy at the Royal Free Hospital on Wednesdays from April 10th; a three weeks' course in medicine, surgery, and gynæcology at the Royal Waterloo Hospital from April 15th; and a course in neurology at the West End Hospital for Nervous Diseases. This last course will be from April 15th to May 11th, and will consist of lecture-demonstrations, at 5 P.M. (minimum entry ten). Detailed syllabuses may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1. and also information on post-graduate work in London at the general and special hospitals affiliated to the Fellowship.

The Fellowship proposes to start a course for the July examination for Membership of the Royal College of Physicians of London. Sixteen lectures will be given. Further details are obtainable on application.

UNIVERSITY COLLEGE HOSPITAL.—At the annual meeting of the corporation of this hospital last week, at which Prince George was elected President, it was stated that the reconstruction of the main buildings has been completed and that the full complement of 529 beds is now available. The new preliminary training school for nurses, to which the Rockefeller Foundation has given £31,000, is being erected and will be completed within the next 12 months. The number of in-patients increased from 6580 to 7753, and of out-patients from 247,786 to 258,142. The hospital is seriously handicapped by the insufficiency of its supply of radium.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Case Committee 47 applications were considered and 44 grants were voted, amounting to over £979. The following is a summary of three cases of widows who have been helped:—

Widow, aged 52, of M.R.C.S. who died in February. Has been left with a capital of £300; her income can only be £15 a year. A few friends have clubbed together and have promised to give £60 yearly. The Fund voted £36.

Widow, aged 41, of M.R.C.S. who died at the age of 56 in February. It is hoped that the practice will be sold for £1750, the interest on which will be the widow's only income. There is a boy of 9 to educate. The Fund voted a maintenance grant of £26 and efforts will be made to find salaried employment for the widow and help will be given when necessary for the education of the boy.

Widow, aged 65, of L.R.C.P. & S. Was left destitute on the death of her husband. She has supported herself as companion to a lady, but has broken down in health. She has had to undergo an operation and is now a semi-invalid. Her income is £77 per annum. Fund voted £26.

Subscriptions and donations are urgently needed and should be sent to the hon. treasurer of the Fund, at 11, Chandos-street, London, W.1.

DUDLEY GUEST HOSPITAL.—In consequence of heavy pressure upon the beds and a long waiting-list, a number of new wards are to be added at a cost of £50,000.

LIVERPOOL ROYAL INFIRMARY.—In consequence of the success of the penny-in-the-pound scheme a further section of the new nurses' home is to be built. The old home will be used to increase the hospital accommodation.

NOTTINGHAM GENERAL HOSPITAL.—Last year the in-patients numbered 6395, who, at £3 0*s.* 10*d.* per week, cost an average of £7 19*s.* The average per occupied bed for the year was £158 3*s.* 10*d.*, an increase of £6 8*s.* 7*d.* over the previous year. An additional storey is to be added to form a children's ward.

BIRMINGHAM GENERAL HOSPITAL.—Huts containing 60 beds and a new casualty department are to be erected to enable casualties and in- and out-patients to be dealt with more adequately. A diabetic clinic has been established under Dr. A. P. Thomson, and an asthma clinic under Prof. W. H. Wynn is being worked with a committee formed to promote investigation into this disease.

THE MANCHESTER HOSPITALS.—Last year out-patient attendances at the Manchester and Salford Hospital for Skin Diseases exceeded 82,000, an increase of nearly 7000. The increase was largely due to attendances of patients for artificial sunlight treatment, which numbered 16,000. Nearly 30 per cent. of the total income was derived from voluntary contributions by patients.—Nearly 20,000 cases were treated in 1928 at St. Mary's Hospital for Women and Children. During the year 49 medical men and 48 nurses received special instruction.

QUIET SLEEP IN HOSPITALS.—The Leicester and County Saturday Hospital Society last year raised £45,521, an increase, notwithstanding local trade depression, of £1440. Reporting on the Desford Hall Convalescent Home, Dr. Gordon Kelly told the annual meeting that he had been so much impressed by the delight of the patients in uninterrupted sleep that he was suggesting to the Board of Leicester Royal Infirmary the desirability of getting the street adjoining the infirmary closed to vehicular traffic after 9 P.M.

Medical Diary.

SOCIETIES.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

FRIDAY, April 5th.—8.30 P.M., General Meeting. Papers will be read by Dr. H. M. Hanschell and Mr. A. O. Ross on the Problem of the Treatment of Venereal Disease in the Mercantile Marine. A discussion will follow.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, April 4th.—4 P.M., Mr. Browne: Talipes.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, April 5th.—4 P.M. Mr. Watkyn-Thomas: The Dying Labyrinth.

Appointments.

CAMPBELL, J., M.B., Ch.B. Aberd., has been appointed Medical Referee for Shetland District; and JONES, A. E., M.B., Ch.B. Glasg., Medical Referee for Kilmarnock District and the Isle of Arran, under the Workmen's Compensation Act.

FAIRLEY, N. H., M.D. Lond., F.R.C.P. Lond., Assistant Physician to the Hospital for Tropical Diseases and Director of the Clinical Laboratory at the Seamen's Hospital.

STEPHENS, J. W. W., M.B., B.Chir. Camb., D.P.H., Honorary Consulting Physician to the Royal Infirmary, Liverpool.

St. John's Hospital for Diseases of the Skin: CORSI, H., M.B., B.Chir. Camb., F.R.C.S. Eng., and TATE, B. C., M.B., B.Chir. Camb., M.R.C.P. Lond., Medical Registrars.

Vacancies.

For further information refer to the advertisement columns.

Altrincham General Hospital.—H.S. At rate of £105.

Ascot Heatherwood Hospital.—Res. Asst. M.O. £300.

Bangor, Carnarvonshire and Anglesey Infirmary.—H.S. £200.

Bedford County Hospital.—H.S. At rate of £175.

Beit Memorial Fellowships for Medical Research.—Jun. Fellows. £400.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. Also Asst. H.P. Each at rate of £100.

Bexhill, Borough of.—M.O.H. £800.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.
Bombay, Goculdas Tejpal Hospital.—Hon. Surgeon. Rs.150 per mensem.
Bootle Borough Hospital.—Hon. Dermatologist.
Bournemouth County Borough.—Asst. M.O. £600.
Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.
City of London Hospital for Diseases of the Heart and Lung, Victoria Park, E.—H.P. At rate of £100.
Connaught Hospital, Orford-road, Walthamstow, E.—Res. H.P. Also Res. H.S. Each at rate of £100.
Durham County Council.—District Tuber. M.O. £600.
East London Hospital for Children, &c., Shadwell, E.—Res. M.O. £200. Also Res. H.S. and Cas. O. Each at rate of £125.
East Riding County Council.—Asst. Tub. O. £650.
East Suffolk, Administrative County of.—Asst. County M.O.H. £600.
Folkestone, Royal Victoria Hospital.—Jun. Res. M.O. At rate of £100.
Gloucester County Mental Hospital.—Jun. Asst. M.O. £350.
Grocers' Company.—Research Scholarships. £300.
Halifax Royal Infirmary.—Third H.S. At rate of £100.
Hong-Kong.—Asst. M.O.H. £740.
Hospital for Consumption, &c., Brompton, S.W.—Asst. Res. M.O. £150. Also Jun. H.P. at Frimley Sanatorium. £100.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.
Hull Royal Infirmary.—Third H.S. At rate of £150. Also Hon. Phys. Also H.P. At rate of £300.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool Heart Hospital.—Hon. Asst. Physician.
Liverpool Port Sanitary Authority.—Asst. Port M.O. £700.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.
London Temperance Hospital, Hampstead-road, N.W.—H.P. At rate of £100.
Manchester, Victoria Memorial Jewish Hospital.—Sen. H.S. £250.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. £150.
Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Res. Med. Asst. £350.
New Delhi, India, Lady Hardinge Medical College.—Prof. of Anatomy. 750 Rs. a month.
Northampton Education Committee.—Asst. School Dentist. £450.
Norwich, Norfolk and Norwich Hospital.—Two H.S's. Each £120. Also H.P. £120.
Prince of Wales's General Hospital, Tottenham, N. — Res. Sen. H.P. Sen. H.S. and Special H.S. Each at rate of £120. Also Jun. H.P. and Jun. H.S. Each at rate of £90.
Penshurst, Cassel Hospital for Functional Nervous Disorders, Swaylands.—Res. M.O. £350.
Royal Chest Hospital, City-road, E.C.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.
Ryde, Royal Isle of Wight County Hospital.—Hon. S. to Ear, Nose, and Throat Department.
St. Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Southampton, Administrative County of.—M.O.H. £1250.
Tynemouth Union, Poor-law Institution, Preston-road, North Shields.—Asst. M.O. At rate of £300.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Two Hon. Anæsthetists.
Western Skin Hospital, 44, Hampstead-road, N.W.—Hon. Asst. Dermatologist.
Wolverhampton, Royal Hospital.—Res. M.O. At rate of £150.
Worcester General Infirmary.—Jun. Res. M.O. £120.
York, Maternity Hospital and Sanatorium.—Res. M.O. £350.

Births, Marriages, and Deaths.

BIRTHS.

GERVIS.—On March 21st, at Welbeck-street, the wife of Harvey Gervis, F.R.C.S., of a son.
THOMPSON.—On March 17th, at Scarborough, the wife of Guy L. Thompson, F.R.C.S., of a daughter.

MARRIAGES.

KELLY—AUSTIN.—On March 16th, at Holy Family Church, Leeds, John Anthony Kelly, M.B., B.Ch., to Pauline Winifred, daughter of the late Mr. and Mrs. T. Austin, of Leeds.

DEATHS.

BYHAM.—On March 19th, suddenly, at Woodlands, Sunbury-on-Thames, William Louis Byham, L.R.C.P., L.R.C.S., a few days before his 67th birthday.
CUMBERBATCH.—On March 23rd, at Great Sarratt Hall, near Rickmansworth, from pneumonia, Alphonso Elkin Cumberbatch, M.B., F.R.C.S., in his 82nd year.
HAWTON.—On March 19th, James William Hambley Hawton, Fleet Surgeon, R.N. (retired), aged 78.
MCDOUGALL.—On March 18th, in London, of pneumonia, Hugh McDougall, M.D., late of Amoy, China, aged 74.
MAY.—On March 19th, at Pilton House, Pinhoe Devon, Henry Ernest May, M.A., M.B., B.Chir. Camb.
WHITTALL.—On March 18th, at Liverpool, Cyril Hubert Whittall, M.B., Ch.B., aged 39.
WOOLHOUSE.—On March 19th, at Carsick, Sheffield, of influenza, Frederick Woolhouse, M.R.C.S., aged 85.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE HEALTH AND CLEANLINESS COUNCIL.

ADDRESS BY COLONEL FREMANTLE, M.D., M.P.

THE third annual general meeting of the Health and Cleanliness Council was held on March 20th when a large number of its members, including representatives of the Society of Medical Officers of Health, of health and education committees of county, borough, and urban district councils, and of welfare centres and allied movements assembled at the Hotel Cecil for lunch, the President of the Council, Dr. G. F. Buchan, occupying the chair.

Following the toast of the King, Lieut.-Colonel F. E. Fremantle, M.P., proposed the prosperity of the Health and Cleanliness Council in a speech, eloquently describing what such a Council had done and might do. He said that he felt himself among friends who had journeyed along parallel roads with himself, engaged with the same spirit in the common task of propagating health and cleanliness. He commended in high terms the literary propaganda of the Council, which was now distributed all over the country, and specially commended for study the lecture which Prof. Bostock Hill had delivered before the Royal Sanitary Institute in January last, in which there was surveyed the whole of health progress, bringing to notice the personal hygiene inculcated by Moses, the water-supply and sewage disposal of Rome, the epidemiological lessons to be derived from London during the great plague and fire, the message from Erasmus to Cardinal Wolsey about the sweating sickness, and the work of Dr. Thomas Trotter, physician to the Navy at the end of the eighteenth century. These things, together with the more modern story, showed how, and how unconsciously the existing régime of a definite organised and recognised prevention of disease and promotion of health had come about. But, said Colonel Fremantle, Prof. Bostock Hill had ended by emphasising the necessity of cleanliness of mind and the cultivation of the health spirit, and that line, the speaker thought, was the essential one, and it was to inculcate the value of a command of the body by the mind and spirit which was the true message of the Health and Cleanliness Council, as it was also the thing which distinguished the sanitation of the future from that of the nineteenth century, and which really went to the root of the health movement of to-day. Quoting from the psychologist, William James, in an address to students on Some of Life's Ideals, Colonel Fremantle said that the hell of the theologian was no worse than the hell we made for ourselves in this world by habitually training our characters in the wrong way, and the great need was to teach a healthy habit of thinking, especially to children—the adult being perhaps past praying for. The chief lessons of the child's life did not depend on his muscle and nerve-fibres but upon the spirit within him, and it was taking this truth into account that made him happy to commend the activities of the Health and Cleanliness Council. He did not belittle the necessity of getting an ample supply of good houses at a favourable rental, but he did say that that was not the essential thing, for people who could not get such houses could by personal volition go much further than they did towards leading healthy lives and bringing up their children to be healthy. But the housing movement should be advanced on proper lines, and the garden city project emphasised the possibilities. Sanitation was good and necessary, and was the work of the health and educational authorities, but the work of the Health and Cleanliness Council was to promote the health spirit and not merely to obviate discomforts of the body. The ideal should be an active life, a life of health which was so great that it could afford within its own lines to break rules of health. But it was necessary to keep a sense of proportion and to live life as a whole in the spirit of health. In conclusion, he advocated the carrying out of the work of the Council in accordance with the true ideals of art and religion at their best, and he said that the services of the artist, especially of the caricaturist, should be employed to present the main principles of the movement in order to bring home to the public a general picture of the healthy mind, body, and spirit which formed the true ideal of the healthy life.

In his reply for the Council, the President, Dr. G. F. Buchan, M.O.H. for Willesden, outlined the work of the Council for the past year. The policy of the Council was to work in coöperation with health societies, local authorities, and organisations, and during 1928 they had assisted at 156 Health Weeks of local authorities, and made awards in respect of as many as 1750 essays by school-children sent in in competition. During the same year no less than 5,000,000 copies of the Council's publications were sent to 2300 districts in England and Wales, while their book,

"Health and Cleanliness," was used as a text-book by teachers in many schools. He referred to the publicity which was obtained by the representation of the Council in the Lord Mayor's Show through the kind offices of Colonel Blackham, and contrasted the advantages which prevailed in America with those which obtained in this country for the better promotion of health, especially through the provision of bathrooms. Representations had been made to the Council, he said, as to the condition of railway carriages, but he pointed out that it was not the policy of the Society to interfere with private firms or corporate undertakings, but rather to inculcate in the public generally habits of cleanliness so that they will naturally demand cleanliness in others. Finally, he justified the work of the Council by the general statement that the public standards of cleanliness ought to be raised, and people brought to recognise that cleanliness had a wide significance which was biological and not only æsthetic.

OPHTHALMIC HOSPITAL OF THE ORDER OF ST. JOHN.

ACCORDING to the annual report for 1928 the number of patients examined at this hospital at Jerusalem during the year was 20,390. Of these, 2254, or 11 per cent., were blind in one or both eyes, the great majority as the result of acute epidemics of conjunctivitis causing corneal ulceration and ending in either total corneal opacity, shrunken globes, or secondary glaucoma. The proportion of blind cases has considerably decreased since the years succeeding the war, but the percentage for 1928 shows a slight increase on that for 1927 owing to the increasing severity of the epidemics of contagious conjunctivitis since 1926, coinciding with the shortage of rains in the winters of these years. Most cases are complicated by trachoma, the incidence of which was 91·3 per cent. as against 78 per cent. in 1926, an increase attributed to the greater proportion of Moslems attending, and the decreased proportion of Jews, the former being the most infected. The work of the hospital is supplemented by that of clinics at six local centres. The operative work both at the main hospital and at the clinics is concerned with trichiasis, a sequela of trachoma, in just over half the cases, and even so the report says that the hospital is still unable to cope with the stream of trichiasis cases that come for treatment.

THE TUBERCLE BACILLUS.

Henry C. Sweany has contributed to the *American Review of Tuberculosis* (1928, xviii., 630) an important and finely illustrated paper on variations occurring in the tubercle bacillus. His procedure has been to watch for unusual forms of the tubercle bacillus—e.g., those showing granules—in culture and in the cadaver, to pass such variants through a series of guinea-pigs and to study any changes in cultural, staining, and pathological characteristics. He has found it possible to restore degenerate forms of tubercle bacilli to forms revealing the characters of the typical human strain. Ordinary micro-organisms unrelated to tubercle will not regenerate in this way. The variant forms should be distinguished from the mutant forms whose degeneracy has become fixed and irreversible.

In the December issue of the same journal Morton C. Kahn and John C. Torrey present a preliminary report on their observations of the developmental cycle occurring in isolated tubercle bacilli growing in a suitable nutrient medium under the microscope. As the result of cleavage in the bacillus acid-fast coccoid bodies, and at times non-acid-fast globoid forms were developed. Further division of the coccoid forms produced diplococcoid types. After further subdivision numerous minute coccoid non-acid-fast forms were seen possibly identical with those described by Much. At a later stage the cocci gave place to dust-like particles, possibly fine enough to pass through a filter. Eventually extremely delicate rods made their appearance from the growth of which adult acid-fast rods were produced. Whether similar developmental cycles occur in the animal body has yet to be determined.

LABORATORY ASSISTANTS' ASSOCIATION.

THE Pathological and Bacteriological Laboratory Assistants' Association continues its successful and useful career. From the last annual report we learn that there are now 534 members organised in eight branches in England, Wales, and Scotland (Ireland seems to be missing), with Overseas' members in various parts of the Empire. The association is an old-fashioned trades-union; its energies are mostly devoted to coöperative education, and as the result of annual examinations held in conjunction with the Pathological Society of Great Britain and Ireland, certificates of proficiency in practical laboratory work are given to the successful candidates. The syllabus for these examinations has recently been revised and candidates can now take either pathology or bacteriology or pathological chemistry as their major subject, with a variety of additional special branches. At the last examination 18 out of 46 candidates were successful, a proportion which speaks well for the stringency of the tests. The council of the association no doubt realises the importance of keeping up the standard, and we believe that the possession of one of their certificates is a real guarantee of proficiency. So long as they may so be trusted, all workers in medical science laboratories will have reason to be grateful to the association for the good work they are doing. Their *Laboratory Journal* contains many useful practical notes and articles. The president of the association is Prof. W. W. C. Topley, and the secretary Mr. H. Gooding, 10, Holbeck-grove, Victoria Park, Manchester.

PLAGUE CAUSED BY AN INFECTION OF THE MIND.

A CORRESPONDENT writes: The following thanksgiving ordered to be used in Elizabethan times may not be generally known and in its quaint wording is worth republishing:—

THANKSGEUING TO GOD FOR WITHDRAUING AND CEASING THE PLAGE. 1563.

WEE yield the hartie thankes, O most mercifull father, that it hathe pleased the in thy wrayth to remember thy mercie, and partlie to mittigate thy severe rodde of this terrible plage, wherwith thowe hast hitherto most iustly scourged vs for our wickednes, and moste mercifully revoked vs from the same. Callinge vs (who in healthe and prosperitie had cleane forgotten bothe the and ourselves) by sicknesse and adversitie to the remembrance bothe of thy iustice and iudgmente and of our owne miserable fraylenes and mortalytie: and nowe leaste wee by the heavines of thyne indignation, shulde have utterly despeyred, comfortinge vs aigayne by the manifeste declaration of thy fatherly inclynation to all compassion and clemencie. Wee beseche the to perfecte the worke of thy mercie gratiously begone in vs: and forasmoche as trewe healthe is, to be sownde and troow in that parte, which in vs is moste excellent, and like to thy godheade; we praye the throughly to cure and heale the woundes and diseases of our sowles, grevously wounded and poysoned, by the deyly assaults and infections of ye olde serpente Saitan, with the deadly plages of synne and wickednes: By the which inwarde infection of our myndes these outwarde diseases of our bodyes have by ye order of thy justice, O Lord, issued and followed, that wee by thy fatherly goodnes and benefytt, obteyninge perfecte health bothe of our myndes and bodies, maye render vnto the therefore contynewall and moste hartie thankes, and that, by flyenge from sinne, wee maye avoyde thyne anger and plages, and ever hereafter, in innocencie and godlynesse of lyffe studienge to serve and please the, maye bothe by our wordes and works allwayes glorifye thy holly name. Which wee besech the to graunt vs, O father of mercies and goode of all consolation, for thy deare sonne, our only saviour and mediator, Jesus Christs sake. Amen.

THE STABILITY OF BLEACHING POWDER.

IN considering the chlorine treatment of drinking-water in our columns a few weeks ago (THE LANCET, Feb. 16th, p. 352) it was remarked that bleaching powder, however cheap and accessible, has proved too erratic for general use as a water disinfectant. We now learn from the technical department of Imperial Chemical Industries Limited that this reproach is to be removed. It is admitted that bleaching powder exposed to a moist atmosphere will absorb moisture and decompose, and that until quite recently it was not prepared in a form sufficiently stable for it to be reliable after any great length of time, particularly when exposed to hot climates. During the last few years, however, great strides have been made in improving the stability of this commodity, and a special grade of Tropical Bleaching Powder is being produced which is remarkably stable even in hot climates. It is a fine white powder containing 25 per cent. of available chlorine, which survives the test of heating in an oven at 140° F. for 28 days without losing as much as 2 per cent. of available chlorine, a test regarded as severe as a year's storage in tropical climates. Samples returned after having been stored in the tropics for two years have shown a decrease of available chlorine only from 25·2 to 23·9 per cent. The test of exposure to a humid atmosphere is not regarded as relevant to this preparation which is supplied in air-tight packages. In this condition, its stability is said to be as satisfactory as that described for succinchlorimide.

LONDON FEVER HOSPITAL.—The number of fever patients treated last year increased by 400 over that of the previous year. Scarlet fever, diphtheria, and measles were the principal causes of the increase. Dr. C. R. Box, the visiting physician, states that the diphtheria cases were not only more numerous, but more severe. Of the 1276 patients treated, 1076 were fever cases, and 200 cases of pulmonary or other forms of tuberculosis. All new nurses who consent are tested for susceptibility to diphtheria and scarlet fever, and if found susceptible are immunised.

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TO

THE LANCET

ON

MEDICAL EDUCATION IN THE UNITED STATES AND CANADA

BY

SIR SQUIRE SPRIGGE, M.D. Cantab.,
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EDITOR OF "THE LANCET."

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MEDICAL EDUCATION IN THE UNITED STATES AND CANADA.

MEDICINE, a science and an art, has no territorial boundaries. However varying in details and in general sequelæ, and however those sequelæ may be influenced according to environment, climate, and circumstances, disease will have general manifestations; there is always something common about pathology making of disease a great international concern and a link between all the peoples of the world. It follows that as far as disease, its manifestations and its expressions, are common, there should be some common form recognised by modern knowledge to be the best by which to train up those who have to combat disease—some form which, while it is applicable, so far as it goes, to the needs of to-day, should be a preparation for the developments of the future.

An English-speaking Union.

The education of medical students on some international pattern would mean a reciprocity in medicine which none of us will live to see, and for which civilisation is not prepared; but, nevertheless, such an event is nearer than would have been thought possible when intercommunication between nations was more limited, and while our conceptions of pathology were less broad. Already the knowledge that British medical men are trained from the start in a form which is comparable to that which prevails in the United States and Canada shows that a practical reciprocity between the medicine of the English-speaking peoples exists, and may be making ready the path for a larger fusion. Hence the pattern of the medical education prevailing on the other side of the Atlantic is important to us all, both for what it is and what it may later imply. Further, fullness of understanding between the English-speaking peoples in all departments of life must make for the happiness of a world that is so permeated with their energies. The informal report which follows is the outcome of a sojourn in the United States and Canada, having these views as its inspiration. An endeavour is made to set out in a succinct shape the educational curricula, as pursued in a representative group of American and Canadian medical centres, in order to see how far the admitted similarity between them and our British curricula is fundamental and what the divergencies may be. The medical centres selected for personal visit number fourteen—twelve in the United States, and two in Canada—and, while it is an undoubted defect in the undertaking that the personal inspection had to be thus limited, the representative character of the Universities, whose medical Faculties are thus brought under notice, will not be disputed.

Centres Visited.

In the United States the representative of THE LANCET visited the Universities of Harvard, Cornell, Columbia, New York, Yale, and Pennsylvania, the Jefferson College, Johns Hopkins and North-Western Universities, and the Universities of Chicago, Illinois, and Ann Arbor; in Canada, McGill University, Montreal, and the University of Toronto were visited. At each University he received the most ample assistance and the readiest help, and our gratitude is extended to all those connected with the different centres of medical education—a very large number—who made it possible for this report to be written.

Medical men in the United States, Canada, and Great Britain are familiar through an English-written medical press, and through many opportunities of personal intercourse, with the leading developments of medical theory and technique in each country; thus they can institute comparisons, giving support to and taking from each other's performances; so what may be called the end-products of our systems of education are known to us. But those systems themselves come under no similar process of inspection, and no such common familiarity with their details exists. Yet, every whit as much as in our pathology, it is of high importance that we should each know what the other is doing; and in the field of undergraduate medical education we can learn much from a pooling of mutual experiences. Just as the manifestations of disease are common so the great objectives of early medical training are common, whatever particular country is in question—if, of course, its standard of civilisation is sufficiently high. All know it to be desirable to educate those who join the ranks of medicine so that the new men shall be able to carry on their work in two main directions—directions which are but two sides of the same road. Those who would join our ranks must be turned out from their medical schools fit to conduct the service of healing for the public good, and they must also have such a conception of the science and art of medicine that they will be able to appreciate and assimilate the meaning of new developments, and, if opportunity arises, to assist in these developments by personal contributions.

Variations in the Curriculum.

These notes on undergraduate medical education form a matter of fact attempt to place before the readers of THE LANCET a précis of medical education as it is conducted at the selected centres, the shape in which the information is supplied being that of the usual educational supplements of THE LANCET dealing with the British medical schools. The history of a school is often pertinent to its development, and a few words are generally included upon the subject; the various curricula are set out in some detail, and the material facilities offered to the students are described, in some cases more fully than in others, while notes are added upon the institutions, small and great—often palatial—at which the clinical instruction is given. How much the whole educational course is the same at each of these centres is revealed by repetitions, and the similarity of these courses to our own statutory pattern, as regulated by the General Medical Council, emerges and reveals the gratifying fact that, in seeking models, neither the United States nor Canada has had any hesitation in looking to Great Britain. At the same time profound differences of ideal and action are evident. The notes upon the fourteen centres are followed by reflections upon these differences, for the comprehension of where the systems of education vary will suggest the places where progress may be made by selection.

MEDICAL EDUCATION IN THE UNITED STATES.

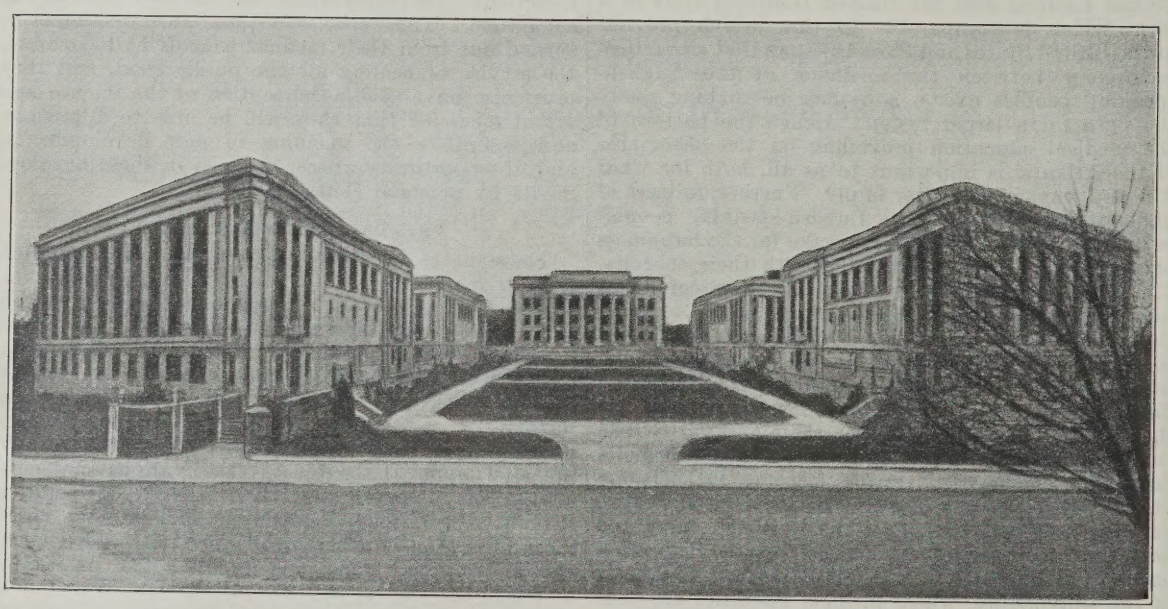
I.—THE MEDICAL SCHOOL OF HARVARD UNIVERSITY.

Historical.

THE course in medicine, established by Harvard University in 1782, was given in buildings of the College, University Hall, and Holden Chapel from the date of establishment until 1810, when the classes were transferred to Boston. In 1816 the first medical school building was erected, while until as late as 1906 the school was situated in the buildings now used by Boston University in the centre of the city; but in 1906 the University completed a notable group of white marble buildings on Longwood Avenue for the occupation of the school. The appearance of the school, owing not only to its structure but to the material employed, can only be described as magnificent (Fig. 1); the use, however, of white marble, not in the original design, was due to the contractors having so much marble at their disposal that they offered to keep their bargain in this way. These buildings, five in number, stand in 11 acres of surrounding ground in the outskirts of Boston, one being designed for the administration and four for the housing of laboratories and departments for clinical instruction. On the road frontage there has now been placed a beautiful war memorial screen.

The administration building contains the Faculty and dean's offices, the central library, and the Warren Anatomical Museum, a very famous collection of over 30,000 specimens, illustrating normal and pathological anatomy. The museum was founded in 1847 by the great Prof. John Collins Warren.

FIG. 1.—THE HARVARD MEDICAL SCHOOL.



THE MEDICAL CURRICULUM.

Matriculation and Requirements for Admission.

The Faculty of Medicine at Harvard provides for a four years' curriculum as a minimum for the acquirement of the sciences directly ancillary to medicine in the school and for their clinical application in the wards of an accredited hospital; but a pre-medical course is assumed, during which a four years' course in a high school or its equivalent must have been completed, in addition to at least two years' work in college, including general inorganic and organic chemistry, physics, and biology. Almost all entrants come in with an Arts degree after four years in a university.

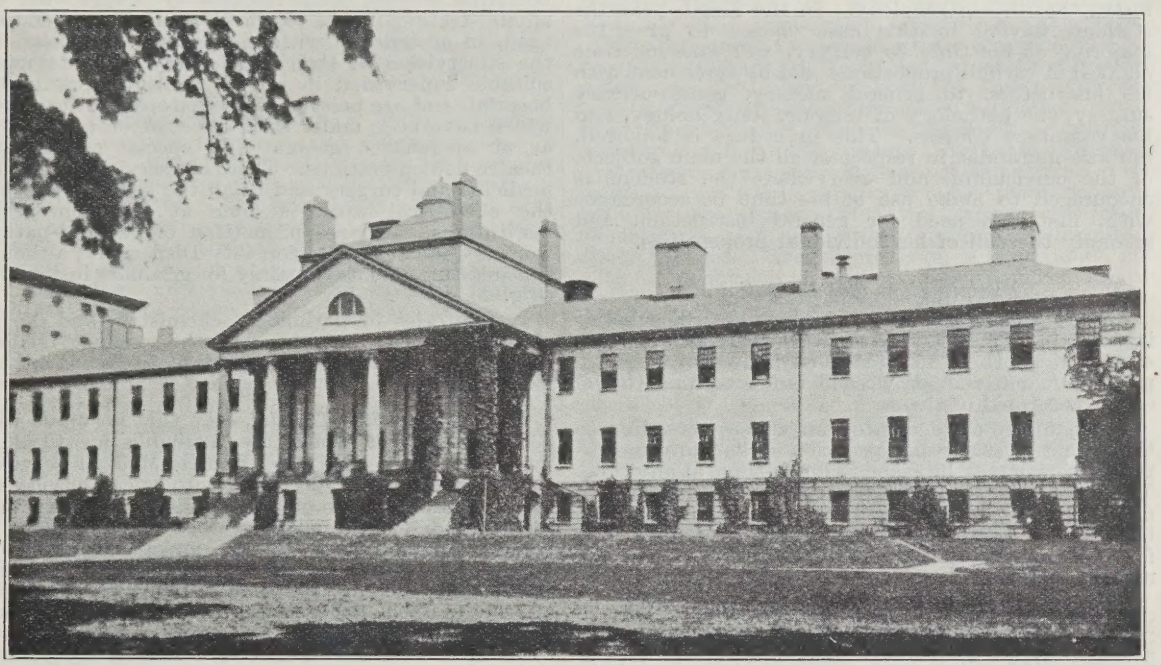
The terminology employed in American universities in setting out their curricula requires a little explanation for British readers. The usual procedures that take place in the American centres are not represented exactly in Great Britain, but just as the objects to be attained are the same so the methods adopted are parallel, though differently named. For example, a high school gives the kind of training that is given in Great Britain at the *public* school, and it is, of course, puzzling to the American to find that the British *public* school is not a State or, as we should say, Board school, but a strictly private establishment. Again, satisfactory evidence of study is provided in America not by simple testamur, but by the production of exact evidence of the time spent in study, as well as details of that instruction. Thus the student desiring admission to the medical school of an American university has to secure "time credits" from his previous school or seminary as proof of his fitness, and this is done by the production of certificates indicating the number of "semester hours" spent to the satisfaction of teachers in acquiring a grounding in selected subjects. A semester hour is one hour of lecture or recitation or two hours of laboratory work per week; as the half year's study is assumed to consist of 16 weeks the duration of the student's actual study can be exactly calculated. To meet the science requirements satisfactorily for admission to any medical school the amount of time credit in an establishment of adequate standing has to be obtained.

At Harvard flexibility in organisation is shown by

the fact that students from other approved medical schools may be admitted to a standing comparable to that they would have held at their original seat of instruction, all matriculation tests having been passed and satisfactory testimonials and time credits produced. Later in the curriculum this process works the other way, for students are allowed, on giving

Second Year.—In this year the time allotted to pathology and neuropathology is large, while more than a commencement of instruction in general medicine and surgery takes place. Anatomy is continued, especially as a study of frozen sections, thus providing a topographical review of the first year's work; bacteriology and physical pathology

FIG. 2.—THE MASSACHUSETTS GENERAL HOSPITAL.



In the Bulfinch building of the Massachusetts General Hospital, in the central dome, the first operation under general anæsthesia produced by the vapour of ether was performed by Dr. W. T. G. Morton on Sept. 30th, 1840.

adequate reasons, to do parts of their work elsewhere than at Harvard, and in this way a Harvard student may acquire something of an international training. Analogous procedures occur at some other educational institutions in the United States.

The candidates for admission to the school largely outnumber those who can possibly be selected, as we shall see to be the case at most of the American universities. Selection is made on general grounds as well as by careful scrutiny of individual claims, but always time credits and proofs of capacity must be produced from proper sources in respect of inorganic and organic chemistry, physics, and biology, with a due knowledge of English, and a reading acquaintance with French or German. The average number of applicants at Harvard during the past five years has been about 400, while the freshman's class has been limited to 125.

SUMMARY OF STUDIES.

The medical course proper extends over four years, while the division of studies is not quite usual, though the logical nature of the scheme is apparent. The length of curriculum is the same as that enjoined by the General Medical Council in Great Britain, as the work of the first year in British schools has to be done in the compulsory pre-medical years at Harvard.

First Year.—The time of the student is divided almost equally between anatomy, histology with embryology, physiology, and biochemistry, but a short course in psychology of distinctly medical bearing is introduced. Half of the time is passed in the dissecting room and half in the histological and embryological laboratories. He must dissect the main divisions of the body to the satisfaction of the demonstrators.

are introduced as well as short courses in obstetrics and pediatrics. The instruction in bacteriology is directed particularly to the consideration of immunity and the problems of infectious disease, the teaching being illustrated by material obtained from the institutions where the later clinical training will be conducted mainly—namely, the Peter Bent Brigham, Massachusetts General, and the Children's hospitals. An early association is thus established between the diagnosis and treatment of disease and is developed by the pathological course. This consists of laboratory work, in connexion with which there are demonstrations of fresh material and museum specimens, and research experiments; while during the entire period groups of students are supervised at various hospitals—those already named, the Boston City Hospital and its adjacent block for contagious diseases, and the Boston Lying-in Hospital.

Third Year.—The student now is mainly occupied with general medicine and surgery; obstetrics and gynæcology are pursued, and there is time allotted for the study of all the usual specialties, the wards both of the great general hospitals and of certain special institutions being available for the purpose. He must take charge of and report on 12 cases in obstetrics under supervision.

Fourth Year.—About 33 per cent. of the time of this last year of study is occupied with medicine and 25 per cent. with surgery, the allotment being reversible at the student's option. The remaining time is divided equally between obstetrics and gynæcology, pediatrics, and "electives"—the term for any branches of medical study which the student may elect to devote additional time to. Life is largely spent in

the wards and can be depicted by an example from what takes place under the heading of surgery. Here, an introductory course in the second year having prepared the students to serve as dressers, they are arranged in small groups in the third year, and serve in the various hospitals under instruction. This takes the form, in addition to ward work, of attendance at theatre clinics where actual patients are shown and diagnosis and treatment discussed over the human subject. There are also lectures and exercises in regional surgery, the whole being accompanied by instruction in rontgenology. In the fourth year the student, having in this case chosen to give the majority of his time to surgery, will find his time allotted in various proportions, and by agreement with his instructors, to general surgery, genito-urinary surgery, the pathology of tumour, rontgenology, and his voluntary courses. This procedure is followed, mutatis mutandis, in respect of all the main subjects of the curriculum, and everywhere the student is encouraged to make use of his time in accordance with, first, his need for general instruction, and secondly the call of his individual propensities.

Examinations and Promotion.

Speaking generally, the procedure described below is general in American universities where students are examined by their own teachers, by whom they are promoted, deferred, or weeded out according to the opinions formed of them.

Students are divided into four classes according to their time of study and proficiency, and any incompetent person may be asked to discontinue at any time. They are examined in each course and marked as determined by each department; they can anticipate the regular course of examinations and they pay fees for each additional examination incurred as the result of failure.

The instructors in the principal courses during the year hold a promotion board for each of the first three years. These boards mark each student for the corresponding school year, promote those who have satisfied the tests, interview, examine, and if necessary warn weak candidates, and have the responsibility of advising students to withdraw. The action of the boards appears to be final, but is not taken without due consideration. A student failing in two major subjects in one year will have to withdraw from the school, while passing in all the subjects at the minimum grade will not earn promotion. Failure, when not entailing rejection, puts the student under a "condition," and he cannot, in ordinary circumstances, proceed with the curriculum until the condition is removed by a successful re-examination. The promotion opportunities, however, are considerable, while chances for re-examination, sometimes of a special nature, are given.

Finally the committee on examinations gives a general examination to each candidate for the degree of M.D. and reports to the Faculty for graduation those properly qualified for the degree and for honours. The general examination consists of practical tests along all the line, including adequate clinical use of the medical sciences; and a student who fails to satisfy the examiner on three occasions is debarred from further attempts.

HOSPITAL TRAINING.

In 1810 the Medical School of Harvard was transferred from the suburb of Cambridge to Boston in order to secure the clinical facilities of the city. These facilities may be regarded as proportional to the number of patients in the hospitals who, being under the care of instructors on the staff of the medical school, are available for teaching purposes; and on this basis the school is closely affiliated with the hospitals now enumerated, three of which have been specially named already. Under the educational scheme each student comes into contact, under supervision, with patients in these hospitals from the second half of his second year until the close of his course, this contact becoming more intimate as the course proceeds.

The Massachusetts General Hospital.—The Massachusetts General Hospital was founded in 1813 and has been associated with the school since the foundation. It contains now 520 beds. A recent extension of the out-patients' department has connected up the Massachusetts Eye and Ear Infirmary with the general activities of the hospital, while the Nurses' Home, standing on the other side of one of the four bounding streets, communicates by tunnel with the administration block. Medical students are encouraged, in accordance with the pattern laid down for the supervision of their studies, to coöperate under suitable supervision in all the routine work of the hospital, and are present at the autopsies of the cases which have been under their direct attention. as well as at operations, general and special clinics, and theatre demonstrations. There are services in general medicine and surgery and in all the specialties, while the obstetrical work is done at the appropriate institutions. A large proportion of the out-patient work is done at the Boston City Dispensary, although this institution is used mainly for graduate instruction (Fig. 2).

Laboratories in pathology, chemistry, and X ray are maintained, and there is an excellent medical library, all of which are open to students in the Medical School.

The Boston City Hospital.—At this hospital, with 939 beds, all of which are available for teaching purposes, the Second and Fourth Medical services, the Fifth Surgical, and the Neurological service are under the direction of professors at the Harvard medical school. In addition there are divisions of pediatrics, gynæcology, and so on, open to students. In the out-patient department new patients furnish additional teaching material. Clinical laboratories are maintained for research, pathology, nephritic, diabetic, blood, pediatric, and neurological work, and basal metabolism. The X ray service is very large and important. There is an excellent library, including 73 current medical journals.—*The Boston City Hospital, South Department.* This hospital is for contagious diseases and occupies a block by itself adjacent to the Boston City Hospital proper. It has a capacity of 338 beds and has abundant material for clinical instruction. Students make ward visits three or more times a week. During the year 1926 there were 1787 cases treated, of which 813 were scarlet fever and 266 were diphtheria.—*Hospital Department: Sanatorium Division.* The Boston Sanatorium for tuberculous patients at Mattapan has recently become a part of the Boston City Hospital. It has a capacity of 422 beds and a daily average of 373 patients. During eight months of the year two to four fourth-year students of Harvard Medical School spend eight hours daily for one week in this hospital under the supervision of the resident physician.

The Peter Bent Brigham Hospital.—This hospital has been closely associated with the Medical School since its dedication in 1913. It is for general medical and surgical cases, and is situated on grounds adjacent to the medical school buildings. There are 246 beds, all of which are used for teaching purposes. There is also maintained an out-patient service for ambulatory medical and surgical patients to which 6192 new patients applied during the past year. There are well-equipped medical, surgical, and pathological laboratories. The hospital, by special arrangement, makes use of the library of the medical school.

The Children's Hospital.—This hospital, adjacent to the school, maintains a medical, surgical, orthopædic, nose and throat, and a well-babies clinic. There are 211 beds, of which 165 are available for teaching purposes. Well-equipped laboratories are provided for the study of material from the wards and out-patient service.—*The Infants Hospital (Thomas Morgan Rotch Jr. Memorial Hospital for Infants)* is

adjacent to and under the management of the Children's Hospital. There are 66 beds, all of which are available for teaching.

The Boston Lying-in Hospital.—This hospital occupies a building in Longwood-avenue, and of the 100 beds 65 are used for teaching. In the out-patient department, 1250 cases were attended last year. under supervision by third- and fourth-year students. A well-equipped laboratory is available.

The Free Hospital for Women, devoted exclusively to the surgical treatment of diseases peculiar to women, has a capacity of 94 beds, of which 74 are available for teaching, and a large out-patient department. Library and laboratory facilities are available.

Boston Psychopathic Hospital, a State institution for acute, curable, incipient, and doubtful cases of mental disease, has 110 beds, all of which are available for teaching, and receives patients at the rate of about 1800 a year. The hospital is equipped with psychological, neuropathological, and biochemical laboratories. The out-patient department receives patients at the rate of 1000 a year. In addition to the psychoses and neuroses the clinical material includes cases of mental defect and instability, and of delinquency.

The Massachusetts Eye and Ear Infirmary.—There are 209 beds in this hospital, 167 of which are used for instruction in diseases of the eye and ear. Nose and throat out-patient operations are done at the Massachusetts General Hospital. Pathological and X ray laboratories are maintained.

The Collis P. Huntington Memorial Hospital and the J. Collins Warren Laboratory of Bio-Physics.—This hospital and laboratory of the Cancer Commission of Harvard University afford opportunity for the study of human tumour cases. The 22 beds are all available for teaching purposes, and the aim of the hospital is to study special problems, more particularly in relation to early diagnosis.

II.—THE MEDICAL COLLEGE OF CORNELL UNIVERSITY.

Historical.

THE Medical College of Cornell University was established in 1898, when Colonel Oliver H. Payne gave several million dollars to the University for this purpose. The college was organised largely through the earnest efforts of Dr. William M. Polk, who became the first dean. It was established in New York City, which is about 300 miles away from Ithaca, N.Y., the seat of Cornell University, in order that the clinical facilities of the great municipal hospital and other institutions in New York should be enjoyed by the students. To bring about a closer coördination of the work at the University at Ithaca with that of the college, the various subjects comprising the first two years of study were offered both in Ithaca and in New York. Later the work at Ithaca was reduced to that of the first year, and departments of anatomy physiology, and biochemistry are maintained. All students are combined for the work of the second and subsequent years in New York.

The principal building is located immediately close to Bellevue Hospital, the main municipal hospital conducted by the City of New York. In this building are housed the departments of anatomy, physiology, biochemistry, pathology, bacteriology, and clinical pathology. The medical library, supplied with the more important medical periodicals in French and German, as well as in English, is also located in the main building. In this building is also the Cornell Clinic (Fig. 3), an out-patient department where all branches and specialties of medicine and surgery are represented. Over 140,000 visits are made to the out-patient department annually, which supplies an important part of the clinical training, and being in close contact with the various laboratory departments of the school, it furnishes material for research as well as for instruction. The Loomis Laboratory, a large building adjacent, affords quarters for pharmacology, experimental therapeutics, experimental surgery, and other fields of teaching and research.

In June, 1927, an agreement was entered into between the Medical College and the New York Hospital, forming the New York Hospital-Cornell Medical College Association. According to the terms of this agreement the two institutions are merged. A group of buildings are being planned which will afford a new and large plant for both the hospital and the college, overlooking the East River, adjoining Rockefeller Institute for Medical Research. Additional endowments have been secured by each institution concerned in the merger, and the entire activities of the medical school will be conducted in this plant. Separate buildings are designed for the various laboratory departments, and the hospital as planned will contain about 875 beds. Special provision is being made not only for medical and surgical departments, but also for psychiatry, obstetrics, and pediatrics. The Association is operated under the supervision of a joint administrative board composed of three governors of the New York Hospital, three representatives of the Trustees of Cornell University, and one other member elected by the appointed members. A director of the Association has been appointed in order to coördinate the activities of the medical school and hospital, and the Faculty and hospital staff are to form one body organised on a university basis.

THE MEDICAL CURRICULUM.

Matriculation and Requirements for Admission.

All students are required to have obtained the bachelor's degree or to be already seniors. In the latter case they have completed three years of college work, and are granted the bachelor's degree by the institution in which this work was done after completion of the first year in the Cornell college. Students are also admitted to the Cornell college who give evidence by examination of having acquired an education equivalent to that required for the bachelor's degree. Practically all students, however, enter after having had three or four years of college work, which must include, as a minimum, two years of chemistry, one year of physics and biology, and adequate training in at least one modern foreign language, preferably French or German. The classes are limited to 65. Students from other recognised medical schools are admitted to advanced standing when there are vacancies in the class to which they desire to enter.

SUMMARY OF STUDIES.

The medical year extends over eight months, from October to June. It is divided into three terms of approximately 11 weeks each. During the *First Year* courses in anatomy, biochemistry, and physiology are pursued. During the first two terms of the *Second Year* physiology, pathology, and bacteriology are the main subjects studied, with a few hours devoted to elementary medicine and surgery. During the third term of the second year pharmacology is studied, bacteriology and pathology are continued, more time is given to medicine and surgery, and introductory lectures to some of the special branches of medicine and surgery are held.

With the beginning of the *Third Year* instruction is largely confined to the clinical subjects, although pathology and pharmacology are continued. Instruction in public health is taught throughout the third year. All the work of the *Fourth Year* is done in the various hospitals and out-patient departments, controlled by or affiliated with the Medical College. For this purpose the students are divided into groups

of about ten students. These groups rotate through the various teaching services in the hospitals and out-patient clinics.

Examinations and Promotions.

Students are advanced in the course from one year to the next upon recommendation by heads of departments after examination in the work of that year, but examinations may, at the discretion of the head of the department, include all the work previously covered in the year or years preceding the examination in question. Examinations are held at the close of each academic year, except that in each course extending through a part of the year only the examination may be held at the close of the course.

A student who fails to pass more than 40 per cent. of the work of the first and more than 30 per cent. of the work of subsequent years is required to withdraw from the school. Students failing to pass less than these percentages of their work are re-examined at the opening of the following session. If they then fail to pass they are required to withdraw from the school. Under special but rare conditions, however, students may be permitted to repeat a year's work.

HOSPITAL TRAINING.

Clinical instruction is given in a number of hospitals, some of which are closely affiliated with the Medical College.

The New York Hospital, the oldest hospital in New York, has entered into an agreement with the school which assigns the pathological and half of the entire medical and surgical services to the Cornell University Medical College for the advancement of its teaching and research. The services of the New York Hospital are very active, and about 100 beds are available for the purposes of Cornell students. The staffs of these services are nominated by the Cornell Faculty.

Bellevue Hospital, situated directly across the Avenue from the Medical College, contains 1200 beds. The hospital is organised in four divisions, one of which has been placed by the trustees of the hospital at the disposal of the Cornell Faculty for medical instruction, which nominates the staff and assumes full responsibility of the clinical work. (See p. xi.)

Memorial Hospital is devoted to the study and treatment of cancer. The Cornell College is responsible for the medical and surgical activities of the hospital and nominates the professional staff. This hospital contains about 100 beds.

Clinical facilities are also afforded by the John E. Berwind Maternity Clinic, the New York Nursery and Child's Hospital, the Neurological Institute, the New York State Psychiatric Institute, and the Manhattan State Hospital for Mental Diseases.

FIG. 3.—THE CORNELL UNIVERSITY MEDICAL CLINIC.

III.—THE MEDICAL SCHOOL OF COLUMBIA UNIVERSITY:

COLLEGE OF PHYSICIANS AND SURGEONS.

Historical.

Columbia University was founded in 1754 by a grant from George II. of England, as King's College "for the instruction of youth in the learned languages and the liberal arts and sciences." The College organised a Medical Faculty some 20 years later and was the first institution to confer the degree of M.D., Robert Tucker and Samuel Kissam being the earliest graduates. In 1784, after the Revolution, the College was reorganised and named Columbia College of New York. In 1814, the re-established Medical Faculty of the College was merged in the College of Physicians and Surgeons, but until 1891 the conjunction was only nominal—since when, however, it has been definite. The College has just moved, to become an integral part of the new Medical Centre, a huge and imposing group of buildings on the bank of the Hudson River.

The Medical Curriculum.

Matriculation and Requirements for Admission.

A collegiate course of four years, terminating with a degree, is the most desirable preparation, but the minimum requirement accepted is attendance for two full years of at least seven months at a collegiate institution acceptable to the University. The subjects at which study by the students for certain hours is required are: physics, inorganic and organic chemistry, biology, and for two years at least English and either French or German. The time which this study has taken is calculated in semesters, and the credit requirements are very strictly adhered to, especially in the case of the admission of special students and those who desire to join as of advanced standing. The average admissions total about 12 per cent. of the applications. No students have been admitted for the last three years who have not to their credit at least three years of college work.

This pre-medical education can also be taken not only at other universities—the Rochester, the Colgate, and Hobart and Ripon Colleges may be mentioned—but can be carried out partly in a combined course with Columbia College. These universities give the M.B. degree to students, who after three years of work with them complete the other year in medicine in Columbia. We may note again the flexibility in reference to the admission of students, native or foreign, to advanced standing in the curriculum after the production of proper credentials, but any such student will be required to submit to examination at the pleasure of the Faculty.

Summary of Studies.

The following is an outline of the work required of the candidate for the degree of Doctor of Medicine during the four years of actual medical study. Each year is divided into three trimesters, the first two years as follows: Sept. 26th to Dec. 6th; Dec. 7th to March 1st; and March 9th to May 18th.

First Year.—The *first* period covers instruction in the elements of anatomy and histology, coupled with work in the laboratory and lectures; while the student is also introduced to biochemistry. In the *second* period, while anatomy is continued and special attention is being paid to neurological anatomy, physiology and biochemistry are the main subjects. The *third* period reviews both physiology and anatomy, the latter especially in the gross.

Second Year.—The *first* period is occupied in the study of pathology and bacteriology, both in the laboratory and through daily lectures. In the *second* period, of full three months, while pathology is continued and developed, the student is introduced to surgery and the art of physical diagnosis. In the *third* period, the continuation of surgery is associated with clinical pathology, psychopathology and pharmacology are introduced, as well as the principles of internal medicine. It should be noted that under the heading of pharmacology is included instruction not only in the action of drugs but in the elements of animal research. This is an invariable rule, and the same connexion is maintained in physiology and anatomy.

Third Year.—In the third, as also in the fourth year, the students are divided into groups, with an eye to a logical order of the main themes and the coördination of the work of each department. The education proceeds in the wards provided by the Medical Centre. There are theoretical and clinical lectures, demonstrations, and clinics in medicine and surgery, gynæcology, neurology, and practically all the important specialties which require particular study. The classes are divided into small groups for instruction in physical and medical diagnosis, and for practical work in the specialties.

Fourth Year.—During the fourth year, various groups of students attend for clinical instruction the wards especially of the Presbyterian and Bellevue Hospitals; while the obstetrical course is carried out at the Sloane Hospital for Women. Practically the whole of this year is spent in hospitals and institutions, mostly affiliated to the new Medical Centre, bedside instruction largely taking the place of general and clinical lectures. The students come into closer contact with the patients in order to apply the various diagnostic methods they have been studying. They learn how to take the history of the case, to arrive at diagnosis and prognosis by complete physical examination and watching the progress of cases, in the course of which they are expected to have an opinion upon treatment. It will be seen that this is a more precise way of stating that in the wards of the hospital the students carry out the duties of clinical clerks and dressers. Out-patient instruction is given at the Vanderbilt Clinic, where exceptional opportunity is afforded for studying all forms of acute disease in infants and young children. But all branches of medicine are represented at the Vanderbilt Clinic, which is the combined out-patient department of all the hospitals at the Medical Centre.

Much attention has been spent at this school over the instruction of students in the diseases of children, and teaching in the fourth year has now been largely concentrated at the Babies and Bellevue Hospitals. A follow-up clinic, established at the latter, offers another teaching resource, as the student is instructed in the management of the congenitally syphilitic child. Similar work is done at the Sloane Hospital, where also there is a follow-up clinic for premature infants. The student, it will be observed, therefore, is here introduced practically to the duties of social service.

Examinations and Promotions.

The procedure already noted in dealing with the medical course at Harvard University is adopted—with differences of detail, and with various assumptions of authority or displays of discretion and sympathy—at all the university medical centres. For a system of set tests at stated intervals by external examiners there is substituted one of continuous inspection under which students who fall behind their classes are dealt with. The regulations at Columbia may be reproduced as showing the general procedure regulating a student's advancement.

1. A student is not allowed to go on with his class who has failed in any one of his courses until he has removed that failure to the satisfaction of the head of the department.

2. (*a*) A student who has failed in two courses in the first year may be allowed re-examination in the two failed courses, provided that the two failures do not include both anatomy and biological chemistry.

(*b*) A student who has failed in two courses of the second, third, or fourth years may be allowed re-examination in the two failed courses, provided that

the total hours of the two courses failed in do not exceed 33⅓ per cent. of the total course hours for that year.

3. A student who has been allowed re-examination and has failed in the re-examination must repeat the entire work of that year.

4. A student may repeat an entire year only once during his medical course, and may not repeat any other year later unless the Faculty of Medicine votes to suspend this rule in his case on the recommendation of the Class Faculty under which the student has been working.

FIG. 4.—THE MEDICAL CENTRE FROM THE HUDSON RIVER.

Left to right—the Psychiatric Institute and Hospital, School of Nursing, and combined Medical School and Hospital building.

HOSPITAL TRAINING.

The Medical Centre.

A permanent affiliation between Columbia University and the Presbyterian Hospital was accomplished in 1921. The two institutions have erected new buildings in close geographical and functional relationship on the large plot of land given to Columbia University and Presbyterian Hospital by Mrs. Stephen V. Harkness. This plot extends from 165th-street to 168th-street and from Broadway to Riverside Park, comprising about 20 acres.

In addition to the College of Physicians and Surgeons and the Presbyterian Hospital, the following institutions are represented at the Medical Centre: the School of Dental and Oral Surgery, Presbyterian Hospital School of Nursing, DeLamar Institute of Public Health, the Sloane Hospital for Women, the Squier Urological Clinic, the Vanderbilt Clinic, the Babies Hospital, the Neurological Institute, the New York State Psychiatric Hospital and Research Institute. This arrangement of buildings brings the various schools connected with medicine and allied subjects in close physical connexion with the hospitals, clinics, and institutes in which clinical instruction is carried on.

Presbyterian Hospital.—The Presbyterian Hospital, one of the general hospitals of New York City, was founded in 1868 for "the poor of New York City without regard to race, creed, or colour." Under the terms of its affiliation with the Columbia University staff, members of the hospital are appointed by the Board of Managers on nomination by the trustees of the University, and every member of the hospital staff is a member of the staff of the medical school. The hospital occupies a 22-story building. In this are the wards of the medical and surgical services, the Sloane Hospital for Women, the Squier Urological Clinic, as well as operating rooms and several floors of housing.

Sloane Hospital.—The Sloane Hospital for Women was built at 59th-street and Amsterdam-avenue, and presented to Columbia University by Mr. and Mrs. William D. Sloane in 1886. In the new buildings it occupies three floors of the main hospital building. The wards of the hospital furnish 128 beds for obstetrical and gynæcological cases. Patients, other than emergency cases, are admitted to the hospital through the ante-partum and follow-up clinics of the hospital, or the Gynæcological Department at Vanderbilt Clinic. The hospital is under the direction of the Department of Obstetrics and Gynæcology, the executive officer of the department being the director of the hospital. The assistant professor, associates and instructors are the attending obstetricians and gynæcologists. The resident and assistant resident obstetricians and gynæcologists are also instructors in the department. Internes of the hospital serve for one year, and are selected from men who have already completed a term in a general hospital. The laboratory work of the hospital is carried on in conjunction with special laboratories of the Faculty. The heads of the various special departments in the Faculty are consultants of the hospital, and the attending physicians in the specialties are appointed from these departments. The deliveries in the hospital number about 1800 a year. The gynæcological service is run in conjunction with the gynæcological service of the Vanderbilt Clinic, and the attending obstetricians and gynæcologists of the Sloane Hospital are in charge of the clinic. The Social Service Department of the hospital keeps in close touch with patients applying for treatment, thus making it possible for students to study the end-results of operative cases and

prenatal, intra-partum and post-partum care of obstetric cases. The care of the infants is supervised by the attending pediatrician.

The Squier Urological Clinic.—The Squier Urological Clinic occupies the entire eighth floor of the new hospital building. It is comprised of wards of 12, 5, and 4 beds, and contains a large number of single rooms for surgical cases in urology. The clinic is under the direction of the Department of Urology, the executive officer of the department being the director of the clinic. The assistant professor, associates and instructors are attending surgeons, and the resident and assistant resident are also instructors in the department. There are laboratories on the same floor, for the exclusive use of the Squier Urological Clinic, fully equipped to do diagnostic, X ray, bacteriological, pathological, fluoroscopic and research work, necessary for the care and treatment of patients. There are two large, especially equipped operating rooms and surgical clinics are held by the attending staff, throughout the year. The out-patient department of the clinic is situated in the Vanderbilt Clinic, and is under the direction of the attending staff of the Urological Hospital. The out-patient department is fully equipped for cystoscopic, X ray work, fulguration, diathermic and laboratory work. The Harkness Pavilion is available for the accommodation of private patients of the attending staff.

The Vanderbilt Clinic.—The Vanderbilt Clinic, presented by the Vanderbilt family to Columbia University in 1888, has become the common out-patient department for all the hospitals affiliated in the Medical Centre, and is a fully equipped dispensary for the sick poor. It affords ample material for extended practical clinical instruction in the various departments of medicine, as the professors, with their clinical assistants, have the entire charge of its

IV.—THE MEDICAL SCHOOL OF NEW YORK UNIVERSITY:

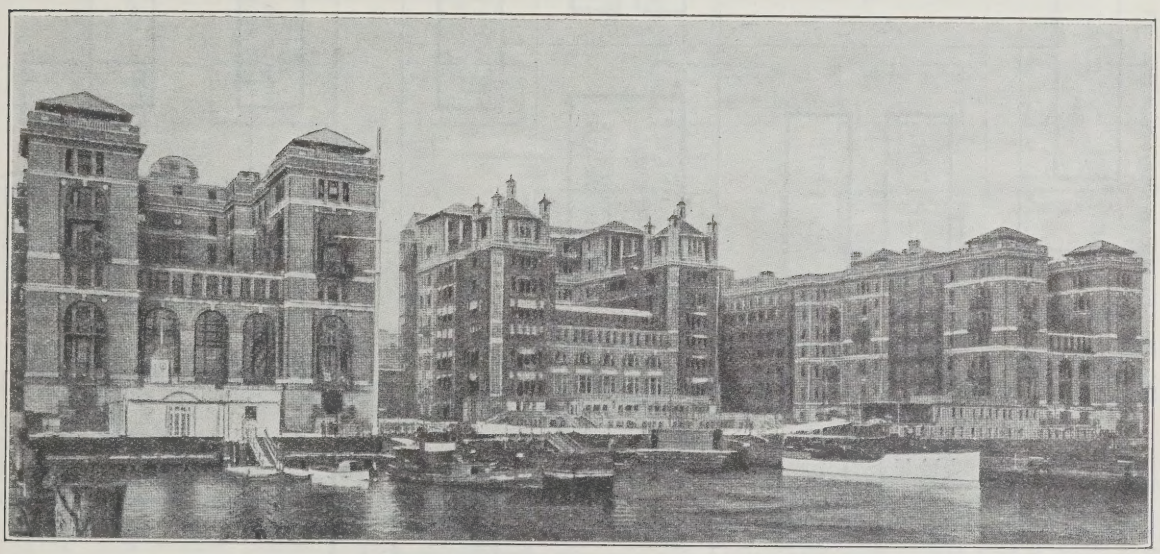
BELLEVUE HOSPITAL MEDICAL COLLEGE.

Historical.

THE University was established in 1898 by the Union of the University Medical College and the Bellevue Hospital Medical College. Instruction was first given in the former in 1841 and in the latter in 1861. The College occupies five large buildings diagonally opposite to Bellevue Hospital, and is officially known as the University and Bellevue Hospital Medical College.

The College building was erected by the Medical Faculty of Bellevue 30 years ago to meet increasing demand for such facilities and was transferred to New York University at the time of the consolidation. Adjoining it is the Carnegie Laboratory, a gift to the Bellevue by the late Andrew Carnegie. The main building, six storeys high, accommodates part of a vast clinic for the outdoor sick poor, while on various floors are research laboratories, working libraries, with an anatomical department on the top floor, having well-lighted and ventilated dissecting-rooms. The Carnegie Laboratory was extended some 20 years ago, again by the gift of Andrew Carnegie, while a large laboratory has been erected to serve as a centre for hygiene and public health. Part of the new laboratory and of the Carnegie Extension serve as an immense out-patient clinic for general medical and surgical cases, diseases of women, and various special pathological conditions. It will be seen that an almost unlimited amount of clinical material lies under the hand of the medical students of the College.

FIG. 5.—BELLEVUE HOSPITAL FROM THE EAST RIVER.



practice. The building is so arranged that each department has rooms for practical instruction to students in small sections. All modern appliances for the treatment of diseases have been introduced, so that students can learn the modern technique in each of the special departments of medicine.

St. Luke's Hospital is a general hospital of first-class standing, with 411 beds, while *St. Mary's Hospital*, a free hospital for children, has 134 beds. Out-patient attendance is optional at either institution.

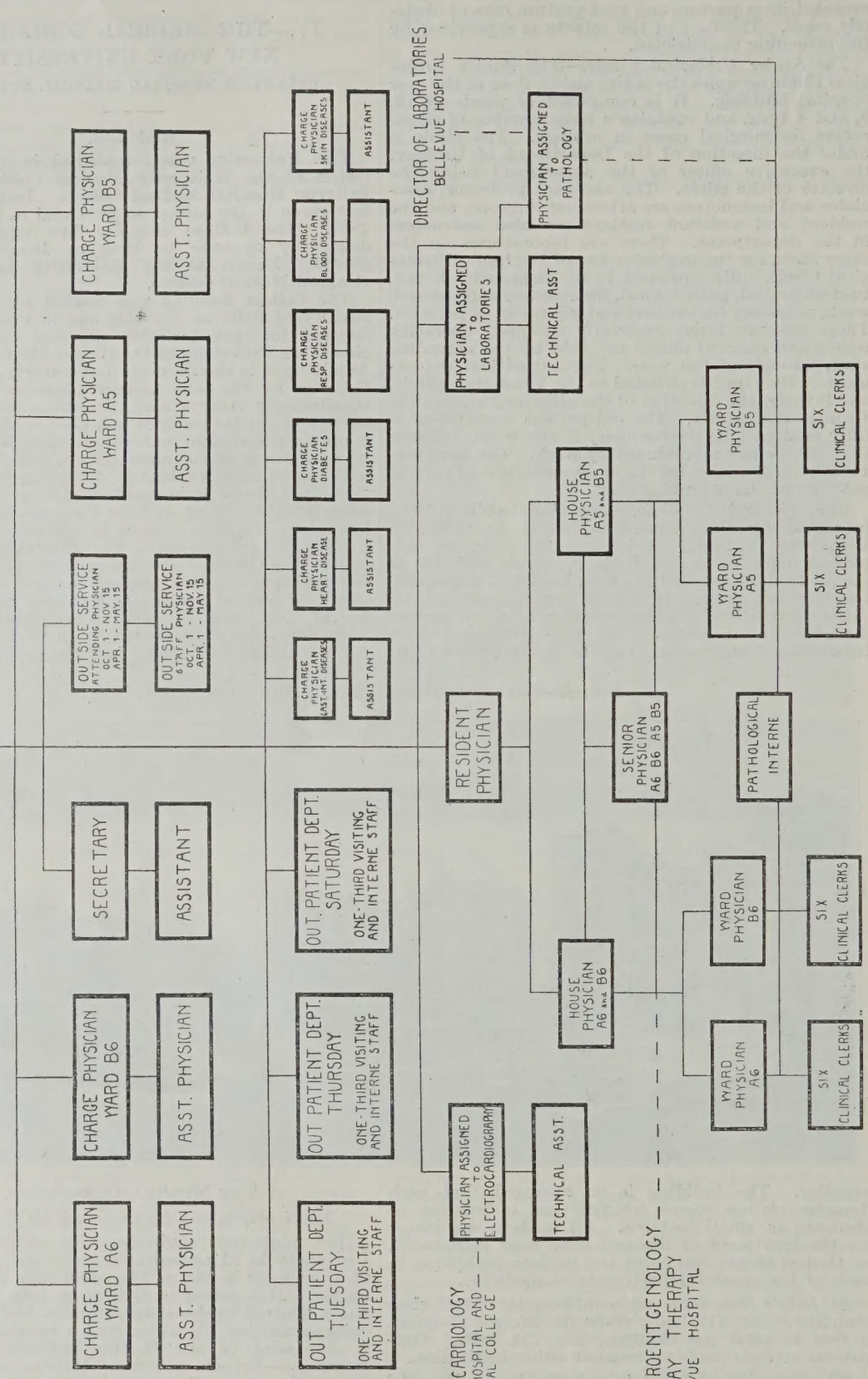
The Neurological Institute and the *Babies Hospital* are in course of construction and new buildings will house these two institutions. It is expected that both will be completed during the coming academic year.

THE MEDICAL CURRICULUM.

Matriculation and Requirements for Admission.

The minimum requirement for admission to the University is 72 semester hours of college work, all of which must be of a sort to count for a baccalaureate degree. This period is divided up into the times of study allotted to chemistry, physics, biology, English composition and literature, and a reading knowledge is demanded of one of the four great European languages—French, German, Italian, and Spanish. Where the applicant has reached all but the last year of university graduation, part of his medical training will count as a fourth year at his university. But while these constitute the minimum requirements for entrance, it is considered that a college course of four

FIG. 6.—CLINICAL ORGANISATION AT BELLEVUE HOSPITAL.


DIRECTOR
SECRETARY
ASSISTANT
CHARGE PHYSICIAN WARD A6
ASST. PHYSICIAN
CHARGE PHYSICIAN WARD B6
ASST. PHYSICIAN
CHARGE PHYSICIAN WARD A5
ASST. PHYSICIAN
CHARGE PHYSICIAN WARD B5
ASST. PHYSICIAN
OUTSIDE SERVICE ATTENDING PHYSICIAN OCT. 1 - NOV 15 APR. 1 - MAY 15
OUTSIDE SERVICE STAFF PHYSICIAN OCT. 1 - NOV 15 APR. 1 - MAY 15
OUT PATIENT DEPT. TUESDAY ONE-THIRD VISITING AND INTERNE STAFF
OUT PATIENT DEPT. THURSDAY ONE-THIRD VISITING AND INTERNE STAFF
OUT PATIENT DEPT. SATURDAY ONE-THIRD VISITING AND INTERNE STAFF
CHARGE PHYSICIAN GAST-INT DISEASES
ASSISTANT
CHARGE PHYSICIAN HEART DISEASE
ASSISTANT
CHARGE PHYSICIAN DIABETES
ASSISTANT
CHARGE PHYSICIAN RESP DISEASES
CHARGE PHYSICIAN BLOOD DISEASES
CHARGE PHYSICIAN SKIN DISEASES
ASSISTANT
DIRECTOR OF LABORATORIES BELLEVUE HOSPITAL
PHYSICIAN ASSIGNED TO LABORATORIES
TECHNICAL ASST
PHYSICIAN ASSIGNED TO PATHOLOGY
RESIDENT PHYSICIAN
SENIOR PHYSICIAN A6 B6 A5 B5
HOUSE PHYSICIAN A5 and B5
HOUSE PHYSICIAN A6 and B6
PATHOLOGICAL INTERNE
WARD PHYSICIAN A6
WARD PHYSICIAN B6
WARD PHYSICIAN A5
WARD PHYSICIAN B5
SIX CLINICAL CLERKS
SIX CLINICAL CLERKS
SIX CLINICAL CLERKS
SIX CLINICAL CLERKS
DEPT. OF CARDIOLOGY BELLEVUE HOSPITAL AND NYU MEDICAL COLLEGE
PHYSICIAN ASSIGNED TO ELECTROCARDIOGRAPHY
TECHNICAL ASST.
DEPT. OF ROENTGENOLOGY AND X-RAY THERAPY BELLEVUE HOSPITAL

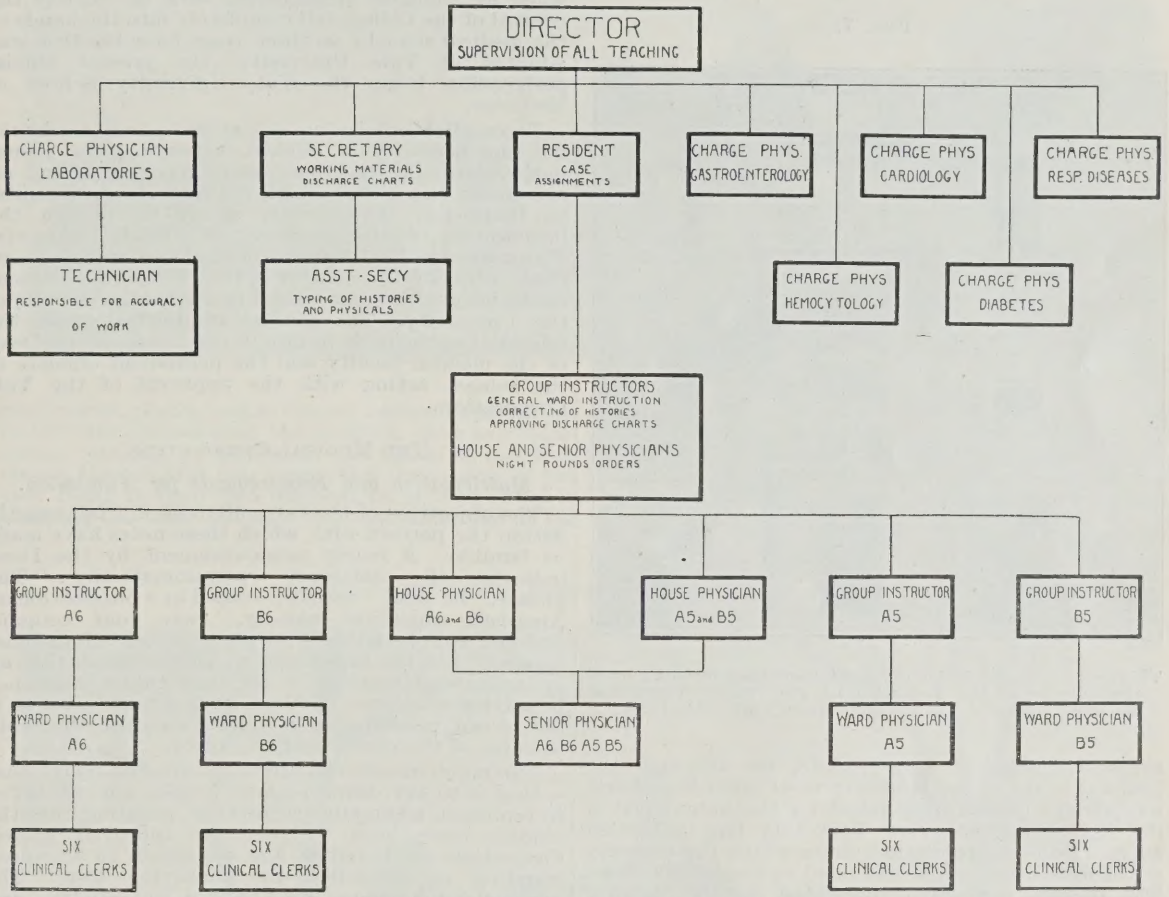
years is the most desirable preparation for the study of medicine, so that preferential consideration, when the students are selected, is given to those of higher scholarship attainment. During the past four years only one student has been admitted who was not eligible for a bachelor's degree at the end of his first medical year. This point should be noted, as the pressure on the school is very high, the last figures being 125 men selected out of 800 applicants.

The same flexibility prevails here as at the Cornell and Columbia Universities, inasmuch as successful students in other colleges are eligible for admission to advanced standing, save in the final year.

satisfactorily completed laboratory courses in normal and pathological histology, and bacteriology, chemistry, physiology, and pharmacology, while they must also have completed their work of dissection. In addition to the certificate in respect of laboratory courses, they must pass examinations in the subjects mentioned, and then further weeding-out takes place.

Third Year.—In the third year the time is mainly occupied by the general study of surgery, medicine, and physical diagnosis, although a reasonable proportion of time is devoted to obstetrics and gynæcology. With the exception of rontgenology, special neurology, and psychology, all the special departments of medical

FIG. 6A.—TEACHING ORGANISATION AT THE BELLEVUE HOSPITAL.



The interrelation between the clinical and teaching duties of the staff will be followed at once on understanding that the assistant physicians in the previous schema are the group instructors in this schema.

SUMMARY OF STUDIES.

The following outline shows the work required of the candidate for the degree of Doctor of Medicine during the four years of actual medical study.

First Year.—This period covers instruction in anatomy, microscopic and gross, and the principles of physiology; teaching develops the pupil's knowledge of chemistry and introduces physiology. Before admission to the second year's study the student must present evidence of having satisfactorily completed the relevant laboratory courses, as well as pass examinations in these subjects. Here the weeding-out process by the instructors begins to take place.

Second Year.—The main subject of the second year is pathology, while physiology is continued, and pharmacology, with its associated study of animal research, is brought into the curriculum. The other teaching, both formal and practical, covers bacteriology and immunology, while the groundwork is laid in applied pathology and surgery. The students cannot enter the third year classes until they have

science are brought to the notice of the students, who cannot enter the final year of study until they have passed written examinations upon these subjects and practical examinations in gross and applied pathology.

Fourth Year.—The time of the fourth year, being spent practically in the wards of the Bellevue, is largely devoted again to surgery, medicine, gynæcology, and obstetrics, but considerable stress is laid at this period upon pediatrics and neurology. At the end of the fourth year the student passes examinations, written and practical, in these various subjects, while his standing is also influenced by the record of his work in classes or wards.

Examinations and Promotions.

At the end of each of the four years of the curriculum the standing of the student is determined by written and practical examinations and by records of work in laboratory or hospital ward. The students are advanced from one year to the next in accordance with the results at the close of each session, and the work of

each year is separately considered, those who fail to pass examinations satisfactorily at the close of any period being unable to proceed to the next period until re-examination at the beginning of the new college year has justified the promotion. Repeated failure implies rejection from the school.

HOSPITAL TRAINING.

The Bellevue Hospital.

The students of the Medical Faculty of New York University are ranged under the Third Medical Division of the hospital, the Second Medical Division comprising the Cornell students, in dealing with whom general notes on the institution were made. But those

FIG. 7.

This doorway in the Bellevue Hospital buildings formed part of the Balcony of the Federal Hall over which Washington delivered his first Inaugural Address on April 30th, 1789.

notes will soon be out of date, for although the hospital is one of the largest in the United States and has always been distinguished for the abundance of its clinical material, New York City has authorised an enormous appropriation under which the capacity of the institution will be extended to nearly 2000 beds. The present appearance presented by the hospital from the East River shows its imposing character.

The members of the Faculty, who are attending physicians and surgeons to the hospital, hold regular clinics for students in the large theatres, and small sections of the classes are taken into the wards to examine medical and surgical patients. Students of the fourth-year class are regularly assigned to the care of cases in the wards under the supervision of the attending and house staffs. Many of the great charitable institutions receive their convalescing or chronic inmates through Bellevue Hospital or its out-patient department, in which more than 75,000 new patients a year are treated.

There is within the College building a medical and surgical dispensary, affording abundant material for practical clinical instruction connected with which are all the necessary laboratories, including a fine X ray department.

The diagrams given herewith set out the clinical and teaching organisations under which the Third Medical Division operate at the Bellevue Hospital, from which it will be seen how intimately the instruction of the students is a definite part of the management of the hospital.

V.—THE MEDICAL SCHOOL OF YALE UNIVERSITY.

Historical.

THE school of medicine was organised initially as early as 1710, when a charter was granted by the Connecticut General Assembly for the Institution of Yale Medical College, to be conducted under the joint supervision of its own President and the Connecticut Medical Society. Although the institution was formally opened in 1813, the medical school of Yale College did not take its real shape until 70 years later, when by amicable arrangement with the society the control of the College fell completely into the hands of the medical school; so three years later the title was adopted of Yale University, the present official designation being the Yale University School of Medicine.

The medical curriculum was at first purely academic, but the necessity of clinical instruction for proper medical training had been early recognised, and an agreement was come to with the New Haven Hospital to that end. As recently as 1914, through the beneficence of the Anthony M. Brady Memorial Foundation, a fund was established and an agreement made whereby the control of the clinical department of the hospital became vested in the medical faculty of the University. The general administration of the school of medicine is to-day in the hands of the Dean of the medical faculty and the permanent officiate of the school, acting with the approval of the Yale Corporation.

THE MEDICAL CURRICULUM.

Matriculation and Requirements for Admission.

The objectives of the curriculum do not fall exactly within the pattern with which these notes have made us familiar. A recent pronouncement by the Dean indicates the difference epigrammatically: "The phrase," he said, "recently coined in a publication on American education, namely, 'Save your coupons and get a diploma,' has no place in our educational system," and the experience at Yale indicates that an inelastic stratification of the curriculum may not be advisable. None the less, such definite plan as is laid down presents, as it must, some of the main features of the plan at other centres.

The requirements for admission are the usual ones—that is to say, three years of college work are taken to represent adequate preparation, granting that the studies have been followed in approved places. Credentials are required, and admission to advanced standing is controlled by qualifying tests. The compulsory subjects are physics, chemistry, and biology, together with mathematics taken up to a point where the elementary principles of the calculus can be comprehended. Importance is attached to humanistic studies, and a knowledge of English, and of French and German up to a point, is expected.

Under the general plan, the subjects of the medical and biological sciences are arranged in two groups, those embracing the basic subjects and those which deal particularly with clinical medicine; when the students have decided upon which field they intend to enter they can elect to take courses accordingly. These courses are divided into two periods of rather more than two years, the first of which, that devoted to basic study, is common to all the students, while the second period is employed in special directions.

SUMMARY OF STUDIES.

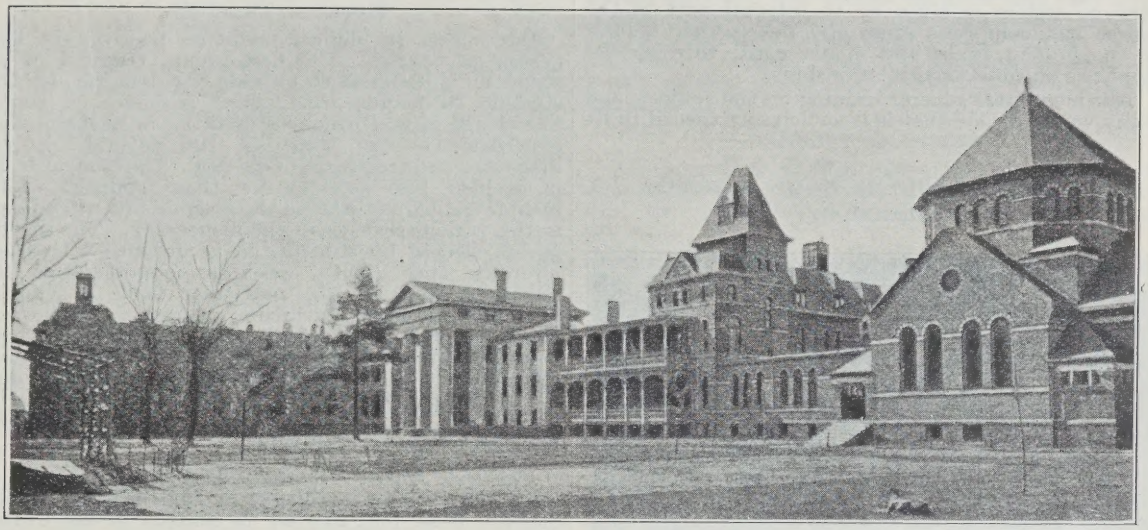
The First Period.—Ordinarily, students take the subjects of anatomy, physiology, and physiological chemistry before the subjects of pathology, bacteriology, and pharmacology; but the students, on testing, are allowed to arrange their curriculum in accordance

with their previous training and their personal bent, under a system of electives.

The Second Period includes the broad field of clinical medicine, training being here given at

It will be seen that the course cannot be reduced to any pattern similar to the routine of education laid down elsewhere, while it puts a premium on the student, at the very commencement of his career, who knows what he

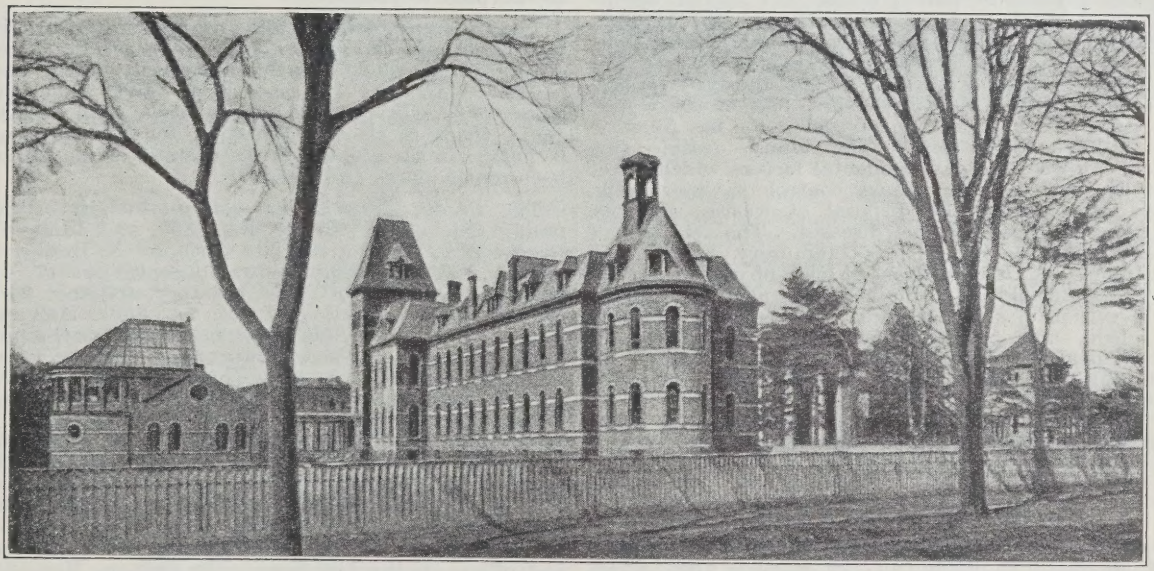
FIG. 8.—NEW HAVEN HOSPITAL FROM THE NORTH-EAST.



conferences, clinics, and in the out-patient department. In the first clinical year the students serve as clinical clerks, rotating by section in the wards of the New Haven Hospital for two terms, the third term of the year being at their own disposal, to be used either in studying the basic subjects or in pursuing one of the

wants. To such an intending doctor the freedom in electing the places where he wishes to concentrate will be a great stimulus, but the responsibility on the authorities who permit him to exercise such discretion is proportionately great. To take two examples. Under the heading "Anatomy," the student has to

FIG. 9.—NEW HAVEN HOSPITAL FROM THE SOUTH-EAST.



branches of clinical medicine, that is, internal medicine, general surgery, gynæcology and obstetrics, or any of the various specialties.

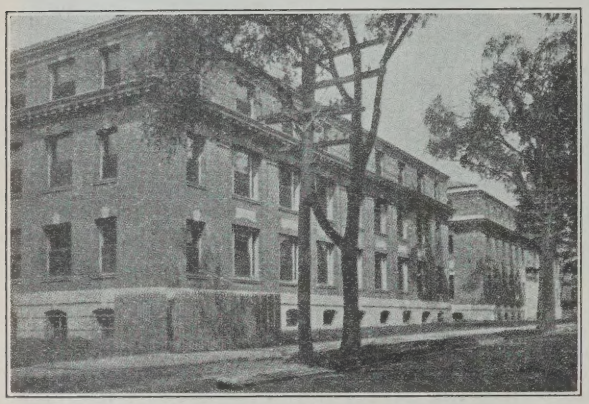
During the second clinical year, students rotate in the out-patient department while using still larger opportunities to take elective courses; indeed, it seems possible for a student to spend the major part of the concluding phase of his training entirely in elective work.

satisfy the demands of a required course during his first two terms. It is chiefly a laboratory course under the supervision of instructors, with conferences correlated with the laboratory work. Gross, microscopic, and developmental anatomy are so combined that the student, while working on the gross anatomy of a part, studies also its microscopic structure and developmental history. In this way a complete picture of an anatomical region is obtained. Two

students dissect an entire cadaver, each being assigned to a lateral half, and all the students will be found working on the same part at the same time. The microscopic structure is studied by means of fresh and stained tissues and the fundamentals of histological technique are included. The study of the development is based largely on preparations from the chick, pig, and man. The anatomy of the central nervous system is given as an integral part of the course and comprises gross and microscopic studies of the human brain and spinal cord, with special emphasis on functional relationships.

This is an ideal general training on the subject, and many would decide that it is sufficiently special in its

FIG. 10.—ANTHONY N. BRADY MEMORIAL LABORATORY.



directions; but the student, confronted with his first direct medical study, can elect to follow that study along 31 different branches by special arrangement.

The subject of public health has similar opportunities for specialisation, though here the student, being in the second period of his studies, may be assumed to know better where his bent lies. The instruction in this subject in the Brady Memorial Laboratory runs thus: The first half of the course is designed to equip the physician for his function as a hygienic adviser to the family, dealing particularly with the environmental factors which affect health, such as the sanitary control of water, milk, and other foods, the disposal of wastes, and the control of communicable diseases. The second half deals with the organised community health programme and the relation of the physician to the work of official health administrative agencies, medical supervision of school-children, problems of industrial hygiene, and infant welfare and antituberculosis movements. But he can elect to follow up 19 subjects falling under the general heading of public health.

Similar opportunities for early specialisation occur throughout the curriculum and may be taken as a feature of the Yale course.

The Examinational System.

Students having acquired, and proved the acquisition of adequate knowledge of the sciences upon which clinical medicine is based, enter for a general qualifying examination to prove that they are able to correlate and utilise knowledge of the various medical and biological sciences as a basis for the study of disease. A student may present himself for this examination when, in his opinion, he is prepared for it. Students failing in this examination *may* be granted the privilege, after further preparation, of taking the examination a second time. A student who fails twice in the qualifying examination will not be allowed to continue in the school of medicine. Thereafter he must show his knowledge of clinical medicine and laboratory technique. Later on, examinations given by the Faculty of Clinical Medicine must be successfully passed and a satisfactory thesis written, while knowledge of their elective subjects has to be displayed.

HOSPITAL TRAINING.

Instruction in clinical medicine is given in two groups of courses. The first group, required of all students, is designed to provide opportunities for the student to acquire, in logical sequence, a sound knowledge of the principles involved in medicine and experience in the study of the natural history, diagnosis, and treatment of diseases. The student body is divided into sections for these courses, which include clinical clerkship in the hospital and attendance in the various services of the dispensary. The second group, elected by students in accordance with their interests and ability, provides opportunities for advanced work in the particular fields of clinical medicine—internal medicine, surgery, pediatrics, obstetrics and gynæcology, and psychiatry. These courses, which are repeated throughout the year, are largely practical in nature and limited to small groups of students. Instruction is further extended by clinics and conferences arranged to afford comprehensive reviews of knowledge.

The New Haven Hospital.—The clinical courses of the students are conducted in this hospital, which has 400 beds, but, like all its similars in the United States, is contemplating great enlargement. The institution comprises, in addition to an administration building and a recently opened private pavilion of 54 beds, a medical, surgical, and gynælogical block, a pediatric ward, and rooms devoted to treatment and diagnosis. The four services thus indicated are staffed by the faculty of the school. The medical service, in addition to 40 beds for the usual diseases, has 34 beds in a contagious pavilion. Surgery has available 109 beds, and gynæcology and obstetrics occupy 78 more. Sixty-one beds, of which 34 are in an isolation building, are devoted to pediatrics.

The *University Clinic* is alike used for instruction in the school and as a dispensary. Instruction is there given by the whole faculty in general surgery and medicine, and all the specialties, and while the laboratory facilities of the hospital are available to the clinic, there is also a laboratory for medicine and pediatrics in the grounds of the hospital, equipped for both routine work and research.

The *Brady Memorial Laboratory*, the gift of the family (Nicholas F. Brady B.A. 1899, and James C. Brady, B.A. 1904) of the late Anthony N. Brady, of Albany, N.Y., was completed and occupied in 1917. In 1928 an extension of this laboratory, together with two additional wings to be known as Lauder Hall and Farnam Memorial Building, was made possible through a gift from the General Education Board. These buildings are on the grounds of the New Haven Hospital and conform in architectural style with the administration building of the hospital. The Brady Laboratory and Lauder Hall serve as the centre for instruction in bacteriology, pathology, and public health. The former contains, in addition, an auditorium, a museum, and an autopsy suite. The serological work of the hospital is also done in Brady Laboratory, and the School of Nursing has classrooms and offices on the first floor. The Farnam Memorial Building adjoins Lauder Hall and is connected with the surgical and obstetrical wards of the New Haven Hospital. This building contains an auditorium, offices, classrooms, and laboratories for the divisions of surgery and of obstetrics and gynæcology. Treatment rooms in the basement and first floors for physical therapy, heliotherapy, cystoscopy, and accident cases, and an operating suite on the fourth floor, including rooms for operative obstetrics, provide additional facilities for the hospital.

VI.—THE MEDICAL SCHOOL OF THE UNIVERSITY OF PENNSYLVANIA.

Historical.

The School of Medicine of the University of Pennsylvania is the oldest in the United States. It was founded in 1765 by Dr. John Morgan, who became its first Professor of Medicine, and who prophesied its future strength in his opening address. Morgan was the pupil of John Hunter, and of William Cullen, of Edinburgh, and it was from Edinburgh that the new school derived its chief inspiration. For a period the headquarters were at various places in the city —among others, in the Presidential House built for George Washington—but in 1873 the school moved to a site adjoining the Philadelphia General Hospital, familiarly known as "Blockley." Then the University Hospital, the first hospital in the United States erected for the use of a medical school, was built, and since then the story has been one of continuous development. Various departments, suitably housed, have made their appearance, with appropriate laboratories, and a large quarter of the city has become a medical centre. The Robert Hare Laboratory of Chemistry, erected in 1877 and at one time the home of the Dental School, now houses the General Chemical Laboratories of the School of Medicine, the Laboratory of Physiological Chemistry, and, on the top floor, the dissecting-room. In 1892 the Laboratory of Hygiene was built, and in 1904 a building was erected to accommodate the Laboratories of Pathology, Physiology, and Pharmacology. The Robert Hare Laboratory will be shortly vacated, as a new building is under construction, attached to the present Laboratories of Pathology, Physiology, and Pharmacology, and this will house the Departments of Anatomy and Physiological Chemistry. The Wistar Institute of Anatomy and Biology, incorporated in 1892, was the first American university institute devoted to advanced study and research in anatomy and biology.

In 1894 the William Pepper Laboratory of Clinical Medicine was erected adjoining the University Hospital, and provides facilities for the prosecution of minute clinical studies and original researches. The Henry Phipps Institute for the study, treatment, and prevention of tuberculosis, was established in 1903; the building, located at Seventh and Lombard-streets, was completed in 1913, and organised and equipped for its university connexion.

In 1909 the University of Pennsylvania originated the first graduate courses in Public Health leading to a degree of Dr.P.H., the Laboratory of Hygiene being erected for the research work and teaching, while the Department was established in 1920. In 1910 the Department of Research Medicine was organised, and in 1916 a "merger" between the Medico-Chirurgical College of Philadelphia and the University of Pennsylvania was completed, and the Graduate School of the University was organised, while two years later the Philadelphia Polyclinic and College for Graduates in Medicine merged with the Graduate School to form a Polyclinic Section. The whole story, it will be seen, is one of the pooling of efforts, and along this policy the future of the Medical School of the University is being designed.

The Medical Curriculum.

Matriculation and Requirements for Admission.

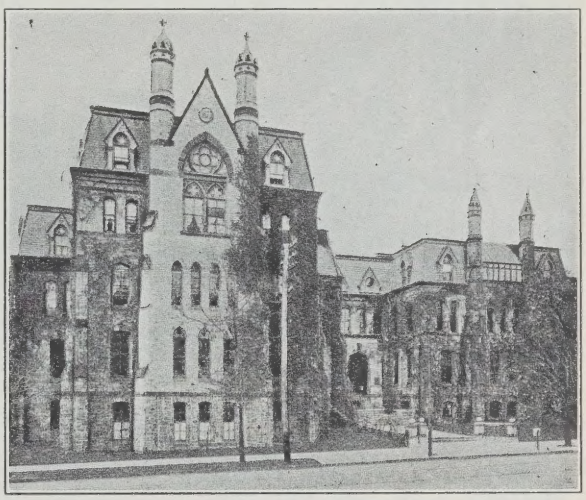
The minimum requirements are a standard four-year high school course or its equivalent, plus three years in an approved college of arts and science, aggregating not less than 45 units, a unit of college work being the same as a semester—namely, the equivalent of one hour of lecture or recitation each week for the full academic year or of two hours of laboratory work each week for the same period. The candidates must have the following credits or satisfactory certificates or proof of having passed an examination in these subjects: chemistry, physics, zoology or general biology, English, and either French or German. The credits should show that the applicant has done appropriate laboratory work in the three science subjects. Students can be admitted to advanced standing, that is to say, can enter in the second and third year classes, on proof that they have satisfactorily completed courses equivalent in kind and amount to those taken by the class to which admission is sought. Only 110 students are admitted yearly, though at least eight times that number make application.

Summary of Studies.

The course of medical instruction proper extends over a period of four years, and the subjects of the first two years follow upon each other in logical sequence.

First Year.—The time is devoted chiefly to anatomy, gross and detailed embryology, normal histology and neurology, physiology, and physiological chemistry.

Fig. 11.—University of Pennsylvania.



Administration Building.

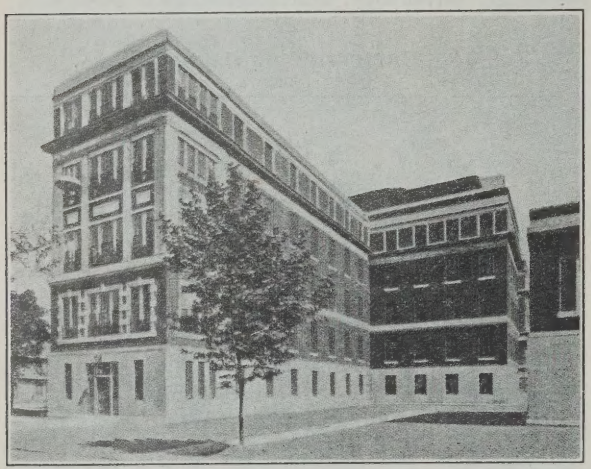
Students are taken in sections, and the instruction in physiology may be used as an example. It covers work on the circulation and respiration and on metabolism, while laboratory work on frogs and the turtle heart is amplified by experiments on the students themselves; so a gradual course is arranged from foundation to coping.

Second Year.—The subjects are pathology, bacteriology, and pharmacology, under which is implied all inquiry into practical therapeutics conducted by animal research. Instruction upon all the subjects of the first two years is almost entirely practical, so that the greater part of the student's time is spent in the laboratory; but a simultaneous introduction is made to clinical work, for once a week throughout the first and second years an elementary medical clinic is given, while a surgical clinic is given in the last half of the year to demonstrate to the students the proper relation of the fundamental sciences to the practical work of healing. Limitation of the first and second year classes to 110 students prevents the possibility of overcrowding the laboratories and ensures a large amount of individual instruction. The major part of instruction in pathology is concentrated in the latter two-thirds of the second year, courses correlating the teaching with ward work extending over the concluding years of the curriculum. In the second year, general and systemic pathology, including parasitology, is lectured upon and demonstrated by teachers,

care being taken to present aspects of the subjects not always contained in text-books and, as far as possible, connected with recent observation. The autopsies at the University and Philadelphia General Hospitals are attended regularly.

Third and Fourth Years.—With the beginning of the third year, detailed instruction in the three great clinical subjects, medicine, surgery, and obstetrics, and in the various specialties, occupies the student's time; and, just as there is no sharp dividing line between the work of the first and the work of the second year, so there is no sharp dividing line between that of the third and that of the fourth year. While the major part of instruction in pathology is concentrated in the latter two-thirds of the second year, in the third year clinico-pathologic conferences are held; patients presenting unusual points of interest

FIG. 12.—UNIVERSITY OF PENNSYLVANIA.



Completed block of new hospital.

are presented for debate by the staff, at which groups of students are present.

The main work of the students during these years is in the wards of the hospitals especially connected with the University—namely, the University Hospital, Philadelphia General Hospital (Blockley), and the Pennsylvania Hospital. The students are now separated into ward groups, and as the various teachers and their assistants are in the wards of one or other of these institutions practically all of each morning, the students are under supervision constantly, and advice is always at their disposal. In medicine they take histories of new cases which are allotted to them, and make physical examinations of each case as it is assigned to them, and they see any special treatment which is produced in the ward. Each student attends special departments of one of the out-patient departments, and in this way gets three months' experience, working there three to five hours a day. Lectures are given throughout the third year which assist the student in his systematic reading to accompany the more intensive clinical work in the fourth year. Each student of the fourth year class works in the clinical laboratory, making routine examinations of all material from patients assigned to him in any of the departments during his final year. At small clinics a case-history will be debated by the fellow students of the reporter, in the presence of the professor, who examines the class upon the diagnosis arrived at and gives reasons for his own views.

The course of instruction in surgery is distributed over two and a half years, for it starts in the second year with an introduction to clinical problems. The third year instruction deals with surface lesions and lesions of the extremities, and lesions of the cranial, thoracic, and abdominal cavities are considered in the fourth year. Every patient admitted to the wards is assigned to whoever takes the history, and the clinical clerk or dresser will follow the patient throughout his stay in the hospital, attending the operative clinics on the cases which have been assigned to him for history-taking. In the closing phase, the student, having mastered the principles of wound repair, anæsthesia, asepsis, antisepsis, hæmorrhage, and shock, attends special units of the out-patient departments, while he is required to make routine laboratory examinations. A course of operative surgery is given on the cadaver. During the fourth year the student, who has been trained in pelvic diagnosis and obstetric procedure on the manikin, attends ten labour cases at least, as well as lectures on gynæcology and conferences upon gynæcological cases recently admitted to the wards.

Examinations and Promotions.

The personal supervision that is possible by the teachers over small classes of students with whom their association is so close makes the processes of weeding-out and of advancement very thorough. The Dean is the last authority in all circumstances, and an interesting sidelight on his responsibilities is thrown, in this University, by the assumption that some of the students may be partly supporting themselves by paid work in what is called their "spare time." By periodical examination the students are placed in category, promoted or referred to their studies in accordance with their instructors' opinions, or rejected. The student who falls behind through stress of private circumstances cannot be categorised as either idle or dull, and wherever possible he is helped, so that the undue strain may be removed.

HOSPITAL TRAINING.

There are three hospitals in the city of Philadelphia at which the students may complete their curriculum—namely, the University Hospital, the Philadelphia General Hospital, and the Pennsylvania Hospital.

The Hospital of the University of Pennsylvania was founded in 1874 and now contains 540 beds. As is the invariable case in the large general hospitals at these great medical centres, the alterations of buildings and the rebuildings have been immense, and to-day both the general, and especially the surgical aspects, are represented in large and well-organised departments, while 22 internes are required to cover the growing demands, as well as six residents. The students, in accordance with the scheme of the curriculum described above, receive clinical instruction in small groups, while larger sections are taken by the professor or his associate over more general ground. The classification of patients treated in the two great medical and surgical departments shows that the training is fundamental, while the departments of gynæcology, pediatrics, ophthalmology, neurology, and orthopædics have adequate facilities. At the laboratories of clinical medicine and surgical pathology bench instruction is given, so that familiarity is obtained with the routine examinations and with the methods in which the numerous tests required by practice in the wards are carried out. There is a department of physiotherapy, and annexed to the hospital is the fine William Pepper Laboratory. Further developments are contemplated in view of new buildings, while the large out-patient department has been recently reorganised, and the dispensary service divided into a general diagnostic section, and a number of special clinics.

The Philadelphia General Hospital.—The hospital stands immediately adjacent to the University buildings, and can well be designated a hospital of the University, a large proportion of the students being always engaged in taking their clinical courses there. The ancestor of the hospital was the "Bettering House" or "Almshouse for Relief and Employment

of the Poor," which from 1767 to 1834 served the purposes of the English workhouse and its infirmary. This building was superseded by a general hospital and lunatic asylum, known for local reasons as "Blockley," and this in its turn has been largely replaced by the enormous modern hospital which is nearing completion. It has 2000 beds, and is constructed with complete thoroughness upon the most modern design. Clinical instruction to the students is indicated by the subjects with which they are to make themselves familiar during the third and fourth years of the curriculum.

FIG. 13.—UNIVERSITY HOSPITAL: THE SURGICAL PAVILION.

An example of a morning's work may be given. The visiting staff officer attended by an interne, the clinical clerk, to whom the duty of reporting the case has been assigned, and a small group of students who have reached the final stage of their course meets the professor, who is also a full physician or surgeon to the hospital. The clinical clerk reads his notes in the presence of the patient, who may, if necessary, be examined. The notes contain a history of the patient, the signs and symptoms on admission, and the results of the laboratory tests that may have been necessary. He is then asked for his diagnosis, when the rest of the class are invited to comment upon their contemporary's work and to suggest alternative diagnoses. All these speculations are then reviewed by the member of the staff who may, for example, rule out one theory as being obviously contradicted by the history, and a second view as being not supported by the symptoms, and so on, until the final diagnosis remains between two or three possibilities. The professor then indicates to the class the reason for his own selection, or he may say that to make any such selection is unsafe without further information. In particular the professor might ask for more assistance from the laboratory than his clinical clerk could supply. Finally, he indicates to the class what sort of information from observation in the wards or findings in the laboratory

he hopes to obtain, and recommends certain places in medical literature where his hearers can read trustworthy accounts of the condition in question. The small clinic thus described is typical of many similar procedures not only in other departments of this hospital, but throughout all the teaching hospitals in America. That this sort of training, more or less of it, is going on in all the centres described may be taken for granted.

The Pennsylvania Hospital.—This institution was founded in 1751, and to it the same story of progress may be applied. It has all the departments necessary for the student's curriculum, and especially a notable neuropsychiatric clinic.

The Episcopal Hospital, a general hospital with 450 beds, is also at the disposal of University teachers and students.

VII.—THE JEFFERSON MEDICAL COLLEGE.

THE Jefferson Medical College was organised in 1825 and in 1828 received a University Charter from the State making it an independent Corporation with the same status as the University of Pennsylvania. The College buildings consist of a medical hall, with lecture rooms, theatres, a museum, a library and laboratories, and special class rooms. On the uppermost, or sixth floor, in addition to the museum are an animal room and the research laboratory of the professor of preventive medicine and bacteriology. The library proper contains more than 6000 volumes, and another library, the Daniel Baugh Library, contains 1200 further volumes dealing with anatomy and embryology.

THE MEDICAL CURRICULUM.

Matriculation and Requirements for Admission.

Candidates must present evidence of having completed a four years' course at an approved high school and two years at an approved college of art or science, the evidence being held satisfactory by the usual semester and credit proofs. The two years at college must have been spent in acquiring ground work in inorganic and organic chemistry, physics (where it is urged that the course should be preceded by mathematical study including trigonometry), biology and English, the additional subjects recommended being a modern language, comparative vertebrate anatomy, psychology, and social science.

SUMMARY OF STUDIES.

The medical course of four years is so arranged that the student is being trained throughout in the fundamental and practical sides of his future calling.

First and Second Years.—The first two years are devoted mainly to the fundamental medical sciences, which serve as a basis for the technical and clinical studies that follow, the larger part of the time being spent in practical work in the laboratories. Emphasis is laid upon the laboratory instruction in anatomy, histology, embryology, physiological chemistry, physiology, hygiene, bacteriology, pathology, pharmacy and pharmacology. For laboratory instruction each class is divided into three groups, thereby affording greater opportunities for individual instruction. All courses are obligatory, and satisfactory work and attendance constitute a requirement for admission to the written examinations. As the ultimate object of the study of medicine is practice, the student, during the *Second Year*, is instructed in the fundamental principles of clinical medicine and surgery, in order that the correlation between theory and practice may be established in his mind early in the course.

Third and Fourth Years.—The laboratory courses are correlated with the clinical branches considered in the third year. During the fourth year the teaching is largely clinical and practical. The fourth-year class is divided into sub-groups of 10 or 12 men, who receive instruction at the bedside and in the dispensaries of the College Hospital and its departments, as well as in other hospitals. Didactic lectures and recitations are given in the Medical Hall on practice of medicine, physical diagnosis, surgery, obstetrics, gynæcology, materia medica, therapeutics, neurology, chemistry, physiology, pathology, bacteriology, medical jurisprudence, hygiene, pediatrics, genito-urinary diseases, orthopædic surgery, ophthalmology, and tropical medicine.

In the College and Laboratory Building, laboratory instruction is given in physiology and pharmacology, physiological chemistry, pharmacy, pathology, including morbid anatomy and pathologic histology, bacteriology, hæmatology, bandaging, major and minor surgery, obstetric manipulations, clinical chemistry, and microscopy. Courses in anatomy, applied anatomy, dissection, histology, embryology, and operative surgery are given also, while in the theatre there are clinics on general medicine, surgery, obstetrics and gynæcology, and all the special subjects. Hospital sections and small ward classes are taken to the bedside or to various special dispensaries, ward-teaching rooms, operating rooms, and mortuary.

The clinical side of obstetrics is taught in the Jefferson Maternity and its dispensary, and in the Wharton-street Dispensary, and regularly scheduled instruction is given in the Jefferson Hospital, Philadelphia General Hospital, the Pennsylvania Hospital, and the Philadelphia Hospital for Contagious Diseases.

Examinations and Promotions.

No student is admitted at any stage to examination unless his class record is satisfactory; students who fail to pass in not more than two subjects can be re-examined before the opening of the next session, and if successful will not lose precedence, but failure in both subjects again will mean removal. Failure in one subject will entail removal of this bad mark by successful examination during the next year, but a student may only carry one such condition into his third year's work, and no conditions are allowed in the fourth year.

HOSPITAL TRAINING.

The *Jefferson Medical College Hospital* is administered by the same board of trustees as the College, and the staff is composed of members of the Faculty and their assistants. By this arrangement all departments of College teaching, including every detail of clinical instruction and laboratory investigation, may be fully correlated. The present hospital was opened in 1907.

The ground floor is devoted exclusively to out-patient services, which also occupy the larger portion of the first floor, in which there are, in addition, administrative offices and reception rooms. The second, third, and fourth floors and part of the eighth, are devoted to ward patients, and, with the private wards, afford accommodation for 377 patients.

The out-patient department is a very large one, the hospital being situated in the centre of the city. The department is so arranged as to afford facilities for the examination and treatment of patients, in which every detail may be followed by students, assigned in sections to the various departments. Under qualified assistants detailed by the professors in charge, students are admitted to wards in which bedside instruction is given. Six operating rooms are especially equipped for section teaching. Under the supervision of professors and instructors, students are required to participate in operations and to assist in the administration of anæsthetics, and are in this way brought into direct contact with the most important details of operative procedures. When the interests of the patient are not thereby jeopardised, the student may follow the case from admission.

VIII.—THE MEDICAL SCHOOL OF JOHNS HOPKINS UNIVERSITY.

Historical.

THE School of Medicine was opened in 1893 as an integral part of the University and in close affiliation with the Johns Hopkins Hospital. The famous letter of Johns Hopkins, in which, exactly 20 years previously, he set out the reason and meaning of probably the largest and most liberal-minded piece of individual charity that has ever been exercised, contains the following paragraph addressed to those whom he selected as the trustees of the movement: "In all your arrangements in relation to this hospital you will bear constantly in mind that it is my wish and purpose that the institution [hospital] shall ultimately form a part of the medical school of that University, for which I have made ample provision by my will."

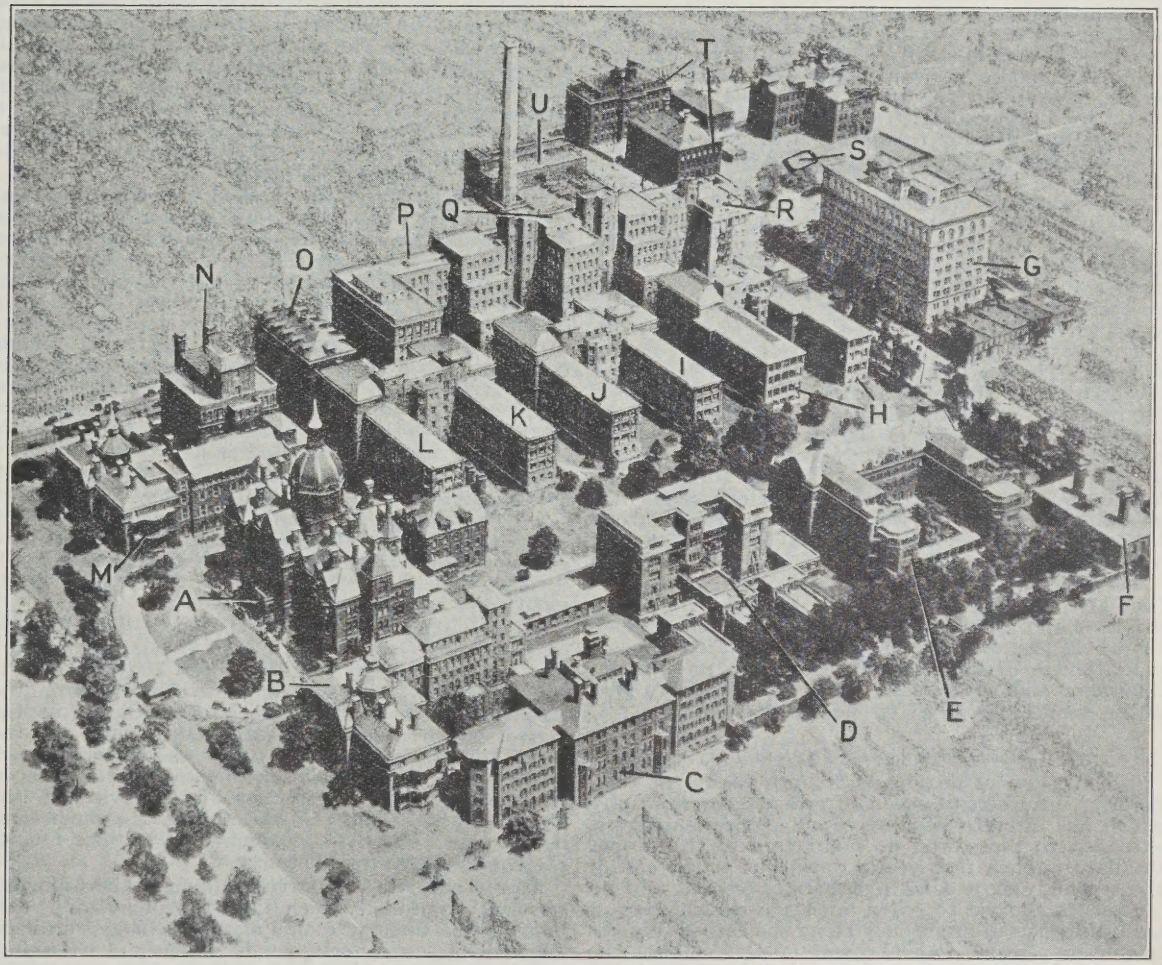
From the opening of the school all the instructors in the underlying scientific branches have devoted their entire time to University duties, while the establishment of the William H. Welch Fund for the advancement of clinical teaching by the General Education Board, some 20 years later, secured a similar basis for the responsible instructors in medicine and surgery and pediatrics. Further endowments have secured similar provision for psychiatry, obstetrics, and ophthalmology. The hospital, which was to be the clinical training ground of the school, was built in 1889; it then had 230 beds and it now has 750. The aerial view shows what it has developed into, and it need hardly be said that it is in the course of making large developments.

THE MEDICAL CURRICULUM.

Matriculation and Requirements for Admission.

The course of medical instruction extends over four years, and the number of students in each class is limited to 75, only students of real promise being admitted. The requirements for admission are a collegiate degree from an approved source, with certification that the applicant has satisfactorily completed certain minimal tests, those being: one year of college work in biology—comparative anatomy, embryology, or zoology being recognised; two years' work in chemistry—three years' work being advised, and inorganic and organic chemistry having been taken; one year of college work in physics; and a reading knowledge of French and German, with an elementary familiarity with Latin grammar.

FIG. 14.—AERIAL PLAN: JOHNS HOPKINS UNIVERSITY, BALTIMORE.



Key to Illustration of Johns Hopkins University.—A, Administration Building. B, Wilmer Ophthalmological Building. C, Old Nurses' Home. D, Harriet Lane Home (Pediatrics). E, Phipps Psychiatric Clinic. F, Laundry. G, School of Hygiene and Public Health. H, Woman's Clinic (Gynecology and Obstetrics). I, Wards. J, Wards. K, Wards. L, Wards. M, Marburg Building (General Surgery and Medicine, Private Pavilion). N, Kitchen Building. O, Brady Urological Clinic. P, Surgical Building. Q, Dispensary. R, Pathology. S, Site of Welsh Medical Library. T, Medical School. U, Power Plant.

The choice of students is made by taking into consideration the character of the college from which the applicant has graduated, his standing in the subjects, and the opinions given by his science teachers; where possible, a personal interview is obtained. As vacancies occur for any overt reason in the second and third years, students are admitted to advanced standing on proof that they have received the equivalent medical training and are able to pass the examinations of the class to which admission is sought.

Summary of Studies.

The major subjects for the four years of the course are: (1) anatomy (including histology and neurology; (2) physiology; (3) physiological chemistry; (4) pharmacology; (5) pathology (including bacteriology); (6) medicine (including physical diagnosis, neurology and clinical microscopy); (7) surgery; (8) obstetrics (including gynæcology); (9) psychiatry; (10) pediatrics; (11) ophthalmology.

In the present curriculum, as recently planned, the work of the *First Year* is so arranged that the student spends practically all of his time in required courses in anatomy (including histology and neuroanatomy), bacteriology, physiological chemistry, physiology, and pharmacology, with a fair proportion of free time in the last quarter of the year. In the *Second Year* the student is required to take courses in pathology, normal physical diagnosis, diagnostic methods, and clinical microscopy, so scheduled that the fourth quarter of the year is entirely free from any required work. In the *Third Year* instruction for the most part is in small groups, and only a minimal number of hours of instruction for the class as a whole have been set down. Required courses in obstetrics, gynæcology, ophthalmology, medical zoology, and hygiene occupy a small portion of the year, but the major part of the student's work is in medicine, in surgery, and in neurology-psychiatry. Courses in each of these three main divisions of medical instruction are given during each of the quarters of the year; the student may select the quarter in which he takes any of the subjects, thus having required work for three quarters and one quarter entirely free. In the *Fourth Year* a similar arrangement is made, but the student is required to take only one quarter's work in medicine and one in surgery. These two major courses are given each of the quarters of the year, and the student may select the quarter for each of the subjects, though, as in the third year, a limitation of the number of students to be accommodated in any of the courses is necessarily imposed. One-half of the student's time in the fourth year is thus entirely free for courses of his own choosing, for additional work in the required subjects, for investigation, or for migration to other medical institutions.

It will be observed that this is an extremely liberal type of curriculum and well calculated to train practitioners of medicine in the double direction which to-day is the model objective—namely, to become practitioners of medicine along modern methods of treatment and at the same time to take active part in the scientific progress of their profession.

Examinations and Promotion.

The method of dealing with unsuccessful or temporarily unsuccessful students differs here from any which has hitherto been observed. More leniency is extended to those who do not attain to the proper standard in their first year's work, but at the end of the second year a definite barrier is erected and no student is allowed to enter upon the clinical side of his training until proficiency along the earlier subjects has been proved. At the end of the courses the rejections are treated as individual cases, and the students are informed of the particular place in which they have failed to satisfy the requirements of the University, and are advised how to make good their deficiencies. If that cannot be done within a reasonable space of time the school is closed to them.

Hospital Training.

The clinical teaching in the hospital is to a large extent informal, and is conducted for the most part in small sections. During the second year the student is taught, in the hospital, the elements of medical and surgical diagnosis. He is introduced to the technique of history taking, of making a physical examination, and of examining the body fluids and excreta by chemical and microscopical methods. In this work he is also taught the use of the more common instruments for examination, such as ophthalmoscope and laryngoscope. This instruction is almost entirely practical, and makes use of the clinical material, and very little of the time is given to didactic lectures. Thus by the time the student enters the third year he has had an opportunity to become familiar with the technique of the basic examinations essential for diagnosis.

The clinical teaching in the third year in medicine, surgery, and neurology-psychiatry is conducted almost entirely in the out-patient department, although in the case of medicine ward patients are used to a limited extent. In the out-patient department the student participates in the daily routine of the clinic, taking histories and examining patients. In this work he is supervised by an instructor. Whole-class clinics in which diagnostic problems presented by patients seen that day in the clinic complete the morning's work. The afternoons are to a large extent free for elective work, although the students in medicine are required to divide their time between working in the clinical laboratory and examining selected cases on the wards. In the third year all the required work in obstetrics is completed. In addition to the section and whole-class exercises in this subject, each student is required to live for a week in the Women's Clinic, and thus has an opportunity to participate in all the activities on the delivery floor during that time.

In the fourth year the student serves as a clinical clerk on the medical wards and as a surgical dresser on the surgical wards for one quarter each. Upon him devolves the responsibility of taking the history and performing the simpler laboratory examinations of those cases assigned to him. Data obtained by him thus go to form part of the permanent case-records of the hospital. He attends ward rounds which are conducted with small groups as a rule, and has the opportunity to attend whole-class clinics. A few exercises in pediatrics and psychiatry complete the required work of this year. Half of the student's time is left free, to be utilised as he chooses.

The basic idea of the entire curriculum is to teach the fundamentals of the medical sciences in as short a time as possible, to train the student in the elementary technique of examination, and thereafter to give him abundant opportunity to educate himself by participation in the routine work of the departments and by independent study.

The appointments originate in the Medical Faculty of the University. After a man is nominated for a post on the Medical Faculty of the University he is recommended for a part of equivalent rank in the hospital. Thus the professor of medicine in the University becomes the physician-in-chief to the hospital, and upon him devolves the dual responsibility of the teaching in medicine and the care of all the patients and the medical service of the hospital, whether on the wards or in the out-patient department. Similar arrangements obtain for all the services and for all ranks.

The in-patients are divided amongst the following services: *medicine*, including neurology and dermatology; *surgery*, including gynæcology, urology, laryngology, and orthopædic surgery; *obstetrics; pediatrics; psychiatry; ophthalmology.* At the present time some of the subdepartments, notably urology, possess a relatively large number of beds at their disposal. This disproportionate growth is the result of fortuitous grants or bequests and does not represent a studied attempt to exalt the specialties.

The Johns Hopkins Hospital.—This is rather a congeries of hospitals than a single institution. The number of beds is something under 800, but extensive additions are already planned to the blocks of wards lettered I, J, K, L. The hospital contains 11 complete departments with all necessary laboratories. The dispensary deals with over 200,000 visits per annum, the applicants for assistance on the charity side representing some 25 per cent. of the total. Every form of general and special service is here represented.

The medical wards of the Johns Hopkins Hospital, as well as the laboratories for clinical instruction of students, were built almost 40 years ago, which makes them venerable structures in the United States. An entirely new medical clinic has been planned as a complete unit, containing wards, dispensary, laboratories for students, laboratories for routine work and for investigation, and rooms and small amphitheatres for teaching, and one portion of the structure has been completed, including out-patient accommodation, various groups of laboratories, and certain teaching rooms. The contemplated additions and modifications are large, and recent constructions show how huge the intended scale is. The dispensary or out-patient department of the medical clinic has been planned so as to divide the patients in a manner which would be analogous in many respects to the medical wards of the hospital. In such relatively small units it was believed that the most efficient service might be rendered to the patient and the most careful work done by the physicians. At a dispensary unit at the Johns Hopkins, therefore, the average number of patients seen varies from 25 to 40 a day; one physician and his assistants are in attendance. Eight students are received for instruction. Each unit is complete in itself and includes waiting space for patients, a consultation room for men, another for women, three examining rooms for men and three for women, a laboratory, a treatment room, a dark room for ophthalmoscopic and laryngoscopic examinations, a room for group teaching of students, a room for secretary, and one room for the nurse and social service worker. There are five such units, and one unit half the size of the others. Three of these are used for general medical cases, one is devoted to syphilis, and one to tuberculosis. The half unit is employed for the special study and treatment of particular groups of patients referred from the other units. It is used on different days for diabetic patients, for the treatment of patients with asthma and hay-fever, or for selected cases of cardiac disease. In addition to these units, which are strictly a part of the medical clinic, there is a unit for neurology and one for dermatology, both of which are nominally subdepartments of medicine. These units occupy four floors of the building, with certain waiting-rooms for fluoroscopic and anthropometric examinations, while the fifth floor is devoted to chemical and physiological laboratories and to offices for the staff. Chemical and physiological laboratories, a biological laboratory, a tuberculosis research laboratory, and a departmental library are also included.

Choosing internal medicine as the branch of study by which to illustrate the methods of instruction, the work is divided into an elementary course, a minor course, and a major course. Each course is approximately of eight weeks' duration. The number of students accepted in any one of these courses is limited. For the elementary course 75 students are accepted, for the minor course 25, and for the major course 20. The elementary course is offered once each year, the minor course three times a year, and the major course four times a year. Any student who has completed satisfactorily the elementary course or an equivalent may apply for admission to the minor course, and any student who has completed satisfactorily the minor course may apply for admission to the major course. This arrangement disregards entirely the fact that the student happens to be in the second, third, or fourth year of the medical school. It gives him the privilege of selecting the time in which he will do his required work in clinical medicine, and places on his shoulders very largely the responsibility for determining the sequence in which he will pursue his studies in the clinical subjects. It also makes it possible to accept special students for these courses in clinical medicine who may come from schools other than the Johns Hopkins, provided their training meets the necessary requirements for admission. The elementary course consists substantially of instruction and practice in the technique of physical examinations which the students must acquire before subjecting the sick to examination, and in history-taking. Later the student is trained in the examination of the blood, urine, and fæces, is instructed in the physical examination of abnormal conditions, and attends conferences and lectures on the interpretation of abnormal physical signs. During the minor course in medicine the student spends his mornings in practical work in the dispensary, attends at noon each day clinics in one or another clinical subject, and divides the afternoons between work in the wards and more advanced work in clinical microscopy.

The students in the major course are assigned to the medical wards as clinical clerks, where their principal object is to observe carefully the symptoms and signs of disease as an active process, and the reactions of human beings to the different disease processes. Each day there are clinics in various subjects, and a feature is made of case demonstrations in the wards. Lastly, the curriculum at Johns Hopkins University is devised to allow the student to follow elective work.

IX.—THE MEDICAL SCHOOL OF NORTHWESTERN UNIVERSITY.

Historical.

THE Northwestern University Medical School was organised as far back as 1859 as the medical department of the Lind University of Chicago, which has now been replaced or merged in the newer institution. This medical school was not only a pioneer in the advancement of medical education in the United States, but was one of the first schools organised in the country as a medical department of an existing university, while it was actually the first American school to enforce a standard of preliminary education. This led to the adoption of longer annual courses of instruction and, in the event, to a graded curriculum in which the studies were assigned in logical order with proper division and association between laboratories and clinical facilities. The medical faculty severed its connexion with Lind to become affiliated with the Northwestern University ten years later, becoming the medical department of that institution. From this time forward the location of the school, which was growing more and more important, changed for various reasons, and in 1905 it became an integral part of the Northwestern University on the Lake Shore Drive, the marine parade of the city, designed to spread indefinitely round the lake (Fig. 15). The magnificent building was given to the University in 1924 by Mrs. Elizabeth Ward in memory of her husband, the late Montgomery Ward.

THE MEDICAL CURRICULUM.

Matriculation and Requirements for Admission.

In addition to the usual certificates of good character, the requirements are as follows: the candidate must have completed two years of work in an approved college or university, following the completion of a high school course or its equivalent. The two years of college work, calculated as usual by semester hours, will have been employed in studies leading to

degrees in science or medicine, and during those two years the student must have acquired knowledge up to the requisite point, of chemistry, zoology, and physics; of English and of one foreign language, and of other subjects such as economics or history, certain variations in the curriculum being here allowed. That the principles of selection between candidates who can prove their suitability is freely exercised stands out from the figures. 130 new students are taken each year; most or all are already university graduates, and those who gain entrance hardly amount to 10 per cent. of the candidates.

SUMMARY OF STUDIES.

First Year.—The time in the first year is occupied with gross anatomy, histology, and embryology, and with chemistry, organic and inorganic, while the student is introduced to physiology, and receives a certain amount of training in psychology.

Second Year.—The main feature of the work in the second year is the large amount of time occupied in physiology and pathology, both subjects being, as might be supposed, chiefly pursued in the laboratories. A full course in bacteriology is taken in this year, while, together with pharmacology, come the courses in the physiology of digestion and metabolism. By lectures and by laboratory work the student learns the action of common chemical agents as well as the physiological implications of absorption, immunisation, anaphylaxis, and so on. In this year also the student is instructed in the art of physical diagnosis, and begins the study of neurology and psychiatry.

Third Year.—Just as the second year could be regarded as a continuation of, or a correlation with, the first year, so the third and fourth years are definitely linked up with the studies of the preceding period. The main instruction is now given in certain hospitals, and for this purpose the students are admitted to the Cook County Hospital, St. Luke's Hospital, and the Wesley Hospital which, when originally erected in 1901, was adjacent to the medical school. In the third year the student covers what may be called the whole ground of medical practice. In the lecture room, in special clinics, in the wards, or in the laboratories, his time is divided between medicine, surgery, obstetrics and gynæcology, with special stress laid upon neurology, genito-urinary surgery, and pediatrics. The necessary clinical pathology is studied, as well as such special departments as dermatology and oto-laryngology.

Fourth Year.—In the fourth year the medical curriculum is completed by the carrying forward of these studies, with the addition of ophthalmology, orthopædic surgery, medical jurisprudence, and active practice in a lying-in hospital — both in the wards and in the out-patient department. The student also must serve his time as clerk both in the hospital and dispensary. In the fourth year the students, who will by this time number about 120, are taken in groups of 40, and within these groups demonstrations are given by the different teachers to small classes of students, the instruction being given both in the third and fourth years. Groups of six men are assigned to one of the three hospitals for various periods for clinical clerk service, one-third of the class being assigned to the out-patient departments. Small groups of students are given instruction in cardiac pathology and physical therapy, while instruction in contagious diseases is met by the permission to certain students to spend one week of continuous residence in the municipal contagious hospital. In short, the work of the senior year is clinical in character.

FIG. 15.—MONTGOMERY WARD MEMORIAL: MEDICAL AND DENTAL SCHOOLS OF THE NORTHWESTERN UNIVERSITY.

Fifth Year.—A year's work as an interne is required for graduation. The class is divided into three divisions: clinical clerk service, out-patient service, hospital clinics and ward walks. Clinical clerks spend 11 weeks of the senior year in an assigned hospital on the wards and in contact with clinical cases. Each clinical clerk must report a minimum of 20 cases. Each case report will include the history, physical findings, symptomatology, clinical laboratory findings, diagnosis, prognosis, general progress, management, and a brief review of the literature. Senior students on out-patient service report cases from the out-patient department in the same manner as students on clinical clerkships. An outcall service is maintained with the out-patient department. Students on the hospital service may elect special clinics in

the several affiliated hospitals. "Ward walks" are a distinctive feature of this service, a phrase that recalls the fact that, until some 50 years ago, clinical education in Great Britain was always termed "walking the hospitals."

Examinations and Promotions.

The system has been very carefully thought out. At the registrar's office the reports upon the students during their course are received from their teachers, graded upon a system of percentage marks under the letters A to F. The lowest passing grade, C, requires an average throughout of 70 per cent., but though this is the minimum of marks for a pass it will not command promotion, an average of C being needed. If during a single quarter a student does not maintain an average of C, he is warned, and a warning in successive quarters constitutes a "probation." A student placed on probation must maintain for the period specified the average grade imposed by a committee on scholarship, and failure results in refusal of further registration. Below 60 per cent. of marks, indicated by D, earns "a condition" for the student, and a condition in one course earns a warning, and in two courses earns probation. Below 60 per cent. implies failure. A student who receives a failure in one course is automatically placed on probation, while if a condition is not removed before the end of the following quarter a failure is recorded, and this must be removed not later than the beginning of the next school year. Examination in any subject may be imposed by a committee of the school before promotion is granted.

Regular examinations are held at the end of each quarter. Second examinations are set for students who have been absent from regular examinations, or who have failed to receive a passing grade at a regular examination. Students delinquent in two or more branches after re-examination are required to take those branches a second time and may not elect studies that conflict with them. Further re-examination may be obtained by special permission.

HOSPITAL TRAINING.

The students receive their principal training at the Cook County Hospital, St. Luke's Hospital, the Wesley and Lying-in Hospitals, though the resources of other institutions are drawn upon.

The Cook County Hospital.—This institution includes a general hospital, a tuberculosis hospital, children's contagious diseases and psychopathic hospitals, with appropriate dispensaries and pathological department. The number of beds in the Cook Hospital is for the moment about 3600, but enlargement is in course of construction, and the pending alterations affect to some extent the bed capacity of the main structure. The psychopathic hospital has 167 beds, and its duty is to act as a diagnostic clinic, so that the length of residence in this hospital does not average more than six days. The Cook County Hospital provides clinical treatment in its various wards for the medical students also of the universities of Chicago and Illinois. The accompanying plan, drawn from the air, shows the general lay-out.

The hospital requires 15 internes, and over 700 autopsies are performed yearly. These, together with weekly clinico-pathological internes, permit groups of students, duly supervised, to get a close insight into the methods and meaning of diagnosis, while in the general pathological laboratory, the biochemical, the electrocardiac, and basometabolic laboratories, they become acquainted with the developments of modern research. Instruction in all the specialties is given both in large general clinics and to small sections of students, especially in the out-patient department.

Wesley Memorial Hospital is situated in the vicinity, and clinics in medicine and surgery are held here regularly and are attended by junior and senior students. The wards and private rooms contain together 225 beds. The operative clinics are a feature here. The hospital was opened in 1888 "for the gratuitous treatment of the medical and surgical diseases of the sick poor," and, largely owing to the munificence of the Deering family, is a fine example of medical charity.

St. Luke's Hospital.—This hospital contains upwards of 400 beds, of which more than one-quarter accommodate free patients. It is for the reception only of acute curable non-contagious diseases and injuries, and the financial status of free or part-pay patients is investigated. The opportunities afforded are freely used by the students principally in their fourth year, and operative clinics are conducted daily.

The Chicago Lying-in Hospital, in the most thickly populated district of Chicago, has 140 beds. It cares for poor women also in their homes. Every student assists at three or more operations, and resides in rotation during three weeks when he is required to attend six or more deliveries, and to make from 80 to 120 post-partum visits.

The Michael Reese Hospital, having, with the *Sarah Morris Children's Hospital* some 400 beds, is regularly attended by senior students for instruction in pediatrics.

X.—THE MEDICAL SCHOOLS OF THE UNIVERSITY OF CHICAGO.

IN the University of Chicago, founded by the late J. D. Rockefeller, we meet with a pattern of education that is definitely founded upon the intention to regard medicine as a branch of university learning, not to be differentiated, save in its particular bearings, from any university faculty; the training, consequently, is designed to be upon lines analogous with those laid down in other departments of the University. The medical curriculum proper is of five years duration, the fifth year being the period of internship.

The medical schools of the University include: (1) the Graduate School of Medicine of the Ogden Graduate School of Science; (2) the Rush Medical College; and (3) the Rush Post-Graduate School of Medicine, whose activities are without the scope of these notes.

The following is an announcement of the University and indicates the objectives of the authorities:—

The Graduate School of Medicine of the Ogden Graduate School of Science was organised in 1924. Its purpose is to serve the medical sciences by research and teaching. It is a part of the Ogden Graduate School of Science and its work is done on the University quadrangles in close contact with that of other scientific departments—physics, chemistry, biology, &c. Departments devoted to the pre-clinical sciences were provided for when the University was founded and established shortly thereafter. Their primary purposes are the development of the sciences and the training of scientists. Since 1899 they have included among the courses offered all those required in the first two years of work leading to the degree of Doctor of Medicine as well as those leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy. With the definite organisation of the Medical School there have been added on the quadrangles clinics and departments devoted to the clinical medical sciences, similarly related to the Ogden Graduate School of Science and with the same general character and purpose. The work of these departments leads to the degrees of Doctor of Medicine, Master of Science, and Doctor of Philosophy. Candidates for the degree of Doctor of Medicine do the work of the first two years in the Graduate School of Medicine in the Ogden Graduate School of Science on the quadrangles of the University.

The work of the third and fourth years may be done either in the Graduate School on the quadrangles

or in Rush Medical College. The requirements for the fifth year may be satisfied either by a year of advanced work in some branch of medical science acceptable to the Faculty of the Graduate School of Medicine, or by a year of successful internship in an approved hospital.

Admission to the Medical Course.

The first- and second-year classes are limited to 100 in each class; the third and fourth-year classes in Rush Medical College are each limited to 140 men. Selection from among the applicants is made on a basis of qualities judged desirable in the pursuit of medicine other than scholarship. Every student must show evidence of satisfactory vaccination.

A Bachelor's degree, equivalent or approximately equivalent to that conferred by leading colleges and universities, is required for admission, and the college work must have included certain semester hours of work in the natural and physical sciences. The applicant must have a reading knowledge of one modern language other than English (German or French preferred); this knowledge is tested by an examination, largely scientific in character. Evidence of interest and ability in research will help applicants.

Certain medical courses are noted for attention, particularly physiological chemistry, quantitative chemical analysis and organic chemistry, embryology, comparative anatomy of vertebrates, pathogenic bacteriology, general bacteriology, and physiology; but it is noted that the study and practice of medicine is so wide a field that no college training can fail to find possible usefulness. The use of the English language, psychology, physical chemistry, advanced biology, advanced mathematics, history, economics, sociology, Latin, Greek, drawing are here suggested. The compulsory subjects are, as they almost must be, chemistry, physics, and biology, but students may prove that they have already studied a medical subject while at college, though this will not shorten for them the medical course proper.

The Ogden School.

Although the pattern is individual—so much so that an authority of the University may be found saying that there is no medical curriculum—the story of student education is similar to that told elsewhere; for pure science must precede applied science, and applied science must precede therapeutics.

In the Ogden Graduate School of Science the student's work may result in his obtaining the degrees of M.D., or D.Sc., or D.Ph. in accordance with varying conditions. The M.D. is awarded on the recommendation of either the Ogden Graduate School or the Medical Faculty of Rush College. The medical degree can be obtained without any collusion with Rush College.

The student, being of age, and having completed satisfactorily four years' medical work in a school approved by the University of Chicago, a certain proportion of which must have been done in the Ogden School, can obtain a four-year certificate, entitling him to serve as an interne for a fifth year and graduate in due course. He must satisfy the authorities of his adequate proficiency in anatomy, physiology, physiological chemistry, and pharmacology; in hygiene, bacteriology, and pathology; in medicine (including therapeutics, pediatrics, dermatology, and neurology); surgery (including orthopædics, ophthalmology, and otolaryngology); in obstetrics and gynæcology.

He must also satisfy *special* requirements of at least one department, and here he may obtain graduation on a Ph.D. thesis as fulfilment of the thesis requirement. He must have passed successfully final examinations in various groups of these subjects, and the examinations may be taken at any time when offered, and no individual course is specifically required for the M.D. degree.

Rush Medical College.

Historical.

At Rush Medical College the clinical medical sciences are acquired by the student in the third and fourth years of his curriculum. This College received a charter by a special act of the State of Illinois in February, 1837. Its founder Daniel Brainerd was its first president. The first course of lectures was delivered in the second story of a frame building on Clark-street, near Randolph, in 1843. In 1844 a college building was erected at the corner of Dearborn-avenue and Indiana-street (now Grand-avenue). In 1867 a larger building was erected on the site of the old one. This edifice was destroyed in the great fire of 1871, and for three years the College occupied a temporary amphitheatre on the ground of the Cook County Hospital, then located elsewhere. In 1875 a clinical building was erected, and in 1893 a laboratory building was erected hard by. The Senn Building, adjoining the clinical building on the east, was erected in 1903. In 1887 the College became the medical department of Lake Forest University, retaining, however, its autonomy. This relation was dissolved by mutual consent in April, 1898, and in the same month affiliation with the University of Chicago was established. In 1883 the Presbyterian Hospital, adjoining the College, was established in affiliation with Rush Medical College. In 1908 an affiliation was entered into with the Children's Memorial Hospital similar to that obtaining with the Presbyterian Hospital. This was transferred in 1919 to the University of Chicago. In 1911 a similar affiliation was entered into with the Home for Destitute Crippled Children, and in 1915 with the Country Home for Convalescent Children.

In May, 1924, a new contract was executed between the Corporation of Rush Medical College and the University of Chicago in accordance with which the affiliation of 1898 was superseded and the University took over the work of Rush Medical College as a department of the University.

Summary of Studies.

The candidate's work before proceeding to clinical studies must have his previous two years' activities duly accredited. That is to say, he must produce time and efficiency certificates with regard to his work in all the usual medical sciences—i.e., anatomy, histology, and embryology; physiology, physiological chemistry, and pharmacology; bacteriology up to a point and the pathology of the laboratory.

The work of the third and fourth years consists mainly of study of the clinical medical sciences: pathology, medicine (including materia medica, therapeutics, and medical jurisprudence), pediatrics, surgery, obstetrics and gynæcology, laryngology and otology, ophthalmology, and dermatology.

Optional courses in addition to those required above are offered to students who desire them, and they are encouraged to spend additional time in special work involving original investigation.

The laboratories at the disposal of the student are numerous, both large and small. The Kent Chemical Laboratory and the Ryerson Physical Laboratory are used for special research; the title of the Hull Biological Laboratories tells their purpose; while new laboratories of physiology, physiological chemistry, and pharmacology have been erected within the last two years. At Rush Medical College the Rawson Clinical Laboratory is placed in a building which houses also a pathological department and a free dispensary, while Senn Hall, erected through the munificence of the late Prof. Senn and other members of the medical faculty, includes a large out-patient department, where much clinical teaching is carried on, conference rooms, and surgical and medical amphitheatres.

Hospital facilities are to some extent in the making as a new hospital and dispensary to be an integral

part of the University structure are imminent. The present University Hospital has 208 beds (Fig. 22, and p. xxxix); the Presbyterian Hospital with 430 beds adjoins Rush Medical College. The students of Chicago University have also access to the wards of the Cook County Hospital and the Chicago Lying-in Hospital.

XI.—THE MEDICAL COLLEGE OF THE UNIVERSITY OF ILLINOIS.

Historical.

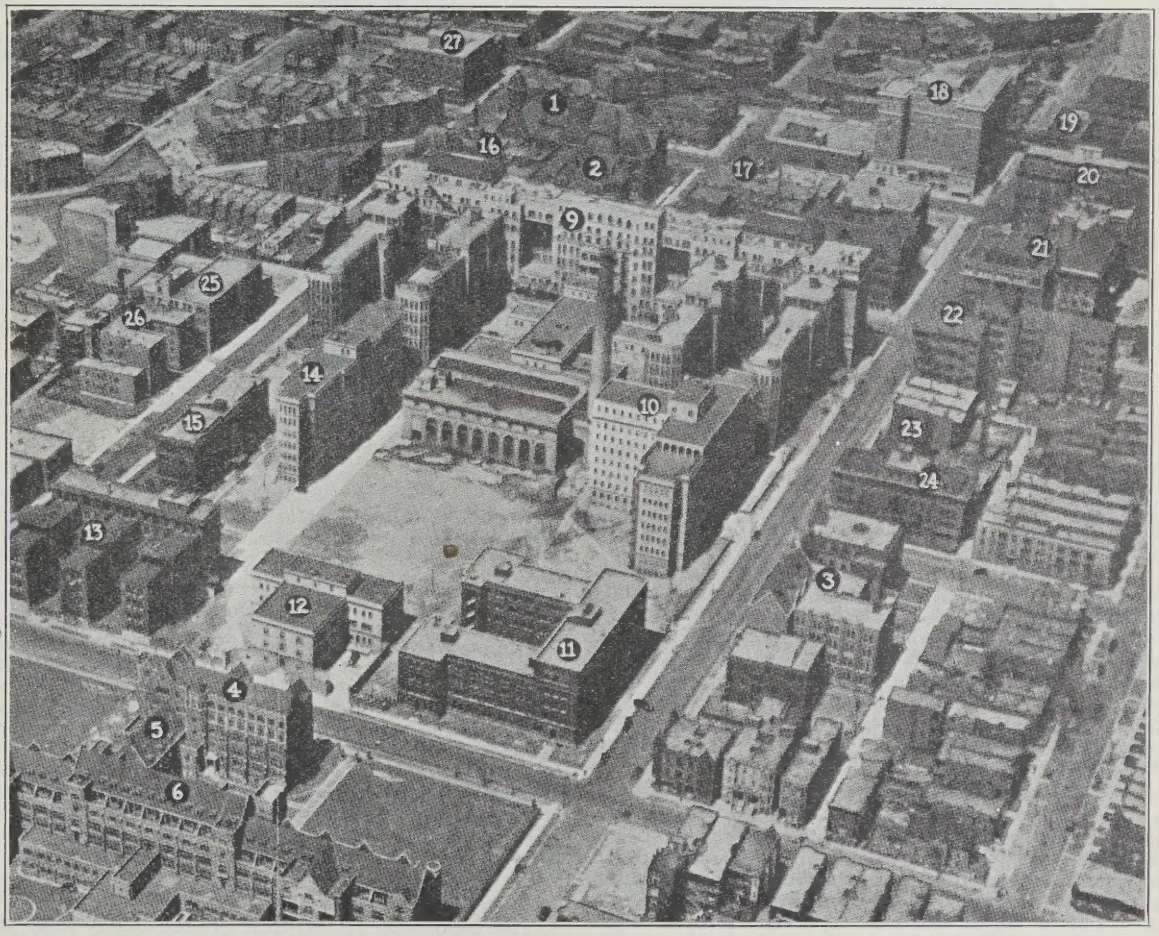
THE Medical College of the University of Illinois, including dental and pharmaceutical students, is situated in Chicago, the main University being at Urbana, 130 miles away. The personnel of this large faculty amounts to about 1200 out of a total of some 14,000 students. This College represents the development of what was 50 years ago the College of Physicians and Surgeons of Chicago. This College has been entirely absorbed, but its original buildings remain (though doomed to pass away) as the official block of the school. The medical school, like the rest of the University, is subsidised by the State of Illinois, the modulus accruing to the Medical College being some $400,000.00. The school, which is structurally in a condition of acute development, possesses a hospital of its own of 150 beds, for special purposes of teaching and for research, all the cases being of a charitable nature; while ordinary clinical instruction is provided for the students, as for the three other universities in the City, in the Cook County Hospital, St. Luke's, Augustana, and Michael Reese hospitals.

THE MEDICAL CURRICULUM.

Matriculation and Requirements for Admission.

For admission to the College of Medicine of the University candidates must present as a minimum four years of accredited high school work, or the equivalent, and two years work in a recognised college or university; the two years of university work comprising as usual the subjects of chemistry, physics, bacteriology, English, and German or French, while certain subjects can be taken voluntarily, such as an ancient language or more advanced mathematics or economics. The

FIG. 16.—THE MEDICAL CENTRE, CHICAGO.



The Medical Centre, Chicago.—The aerial plan shows the Cook County Hospital, where the students of the Chicago and Illinois Universities receive their clinical training, and all the associated institutions, except that for psychiatry and pediatrics, which are situated adjacent to the Main Hospital Building of State Research (see 6 on plan).

University of Illinois.—1, College of Medicine. 2, College of Dentistry. 3, College of Pharmacy. 4, Research Laboratory. 5, Library. 6, Main Hospital Building of State Research and Educational Hospital.

Cook County Hospital.—9, General. 10, Children's. 11, Psychopathic. 12, Morgue. 13, Tuberculosis. 14, Men's. 15. Contagious. 16, West Side Hospital. 17, Illinois Training School for Nurses. 18, Y.M.C.A. (West Side Professional Schools Department). 19, Presbyterian Hospital School for Nurses. 20, Presbyterian Hospital. 21, Rush Medical School. 22, Chicago College of Dentistry. 23, Memorial Institute for Infectious Diseases. 24, Durand Hospital. 25, Loyola Medical College. 26, Frances Willard Hospital. 27, University Hospital.

registered students in the medical curriculum thus have at least a seven-year course, consisting of two years of pre-medical work at Urbana, two years pre-clinical work in the College of Medicine in Chicago, two years of clinical work at one or several of the hospitals, and a further year as an interne in an institution approved by the University. It must always be remembered that the University of Illinois subserves the purposes of the State of Illinois, and some difference is made in respect to the admission of students from without, from whom there is required a scholastic average of at least 10 per cent. above the minimum passing grade.

Summary of Studies.

First Year.—In the first year of the medical course proper the necessary subjects are histology and microscopic anatomy, embryology, regional and systemic anatomy, and gross and microscopic anatomy of the nervous system. A commencement is made also in physiology, bacteriology, and physiological chemistry.

Second Year.—In this year a large amount of time is devoted to physiology and pathology; also to pharmacology, under which heading is included not only materia medica, but general therapeutics, toxicology, physics, and chemistry of the digestive, respiratory, circulatory, and nervous systems. The student is introduced to internal medicine, obstetrics, hygiene, and the fundamental principles of surgery, with instruction, for example, in asepsis, anæsthesia, and surgical dressing, and physical diagnosis.

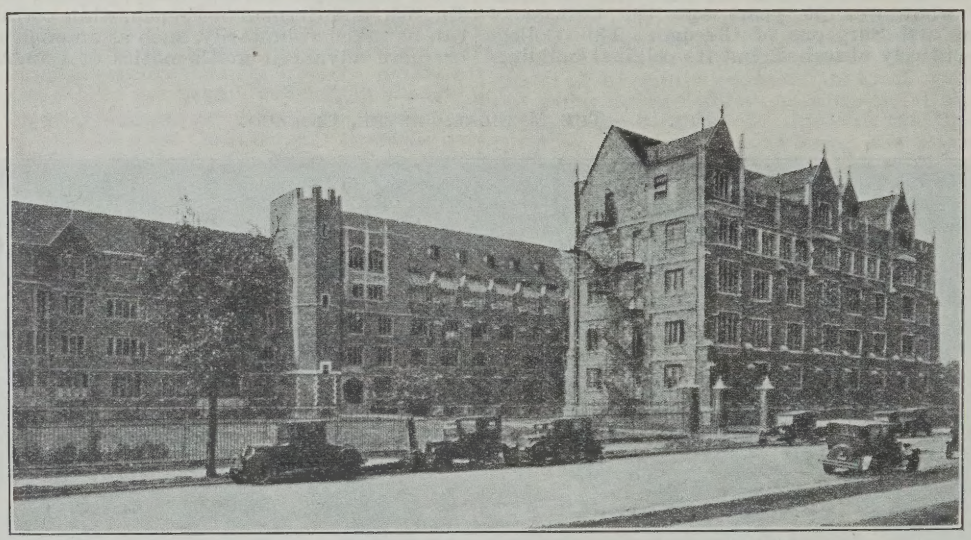
Third Year.—The greater part of the time of the student in the third year is naturally taken up by instruction in the art and science of general surgery and general internal medicine, in the wards of the hospital. Anatomy now becomes topographical, attendance at autopsy is required, instruction in obstetrics is continued, while special attention is paid to such specialties as dermatology, pediatrics, genito-urinary; orthopædic surgery, oto-laryngology, hygiene and jurisprudence also figure in the time-chart, and the length of hours in this year is considerably increased.

Fourth Year.—In the fourth year, while, as before, the greater part of the time is taken up by ward instruction in general medicine and surgery, the other subjects are pursued with various intensity, while the student is invited to take up a large portion of his time in what is termed electives. In other words, he is allowed to indicate the particular subjects to which he proposes to devote special attention.

The clinical instruction, while pursued for particular reasons at different smaller institutions, is largely carried on at the Research and Educational Hospital of the University, at the Cook County Hospital, St. Luke's, Augustana, and Michael Reese hospitals, institutions which provide between them a total of some 5000 beds.

For practical purposes the students admitted all come from the State of Illinois, and the first-year entrance is limited to 130 of those who have satisfactorily fulfilled the necessary tests, other approved students being placed upon a waiting-list. Selection is, no doubt, assisted by the culture of the applicant as indicated in his elective subjects for entrance.

Fig. 17.—University of Illinois.



Research Building, with Educational Hospital in background.

Following the procedure which has already been commented upon in connexion with other universities, a weeding-out takes place, so that at the end of the second year only some 90 to 100 students of the original selection remain, but owing to a liberal though well-scrutinised admission of students of advanced standing, the third year number requiring clinical training is again elevated to 125. These students are divided into groups for teaching purposes and receive instruction on the accepted pattern. That is to say, cases are allotted to them as clinical clerks. Their powers of history-taking, observation, physical diagnosis, laboratory findings, and diagnosis are tested by the professor or associated professor in the subject, and by fellow-students of comparable standing. They defend their judgment as best they can and the teacher uses the situation to give clinical instruction. The same process goes on in the dispensary.

Examinations and Promotions.

The candidate for medical graduation obtains the degree of Bachelor of Science in Medicine by reaching a required grade in three-quarters of the subjects of the curriculum, while of his four years' course one at least must be spent in the University. For the M.D. he must in addition complete a course of 12 months' duration in a hospital affiliated with or approved by the University, though in certain cases a year of research work will be accepted in substitution. Graduation with honours is regulated by the average

success obtained throughout the course, but as early as the second year the student may elect, with the approval of the head of the appropriate department, to pursue a definite line of endeavour, and his success here will count towards his honour degree.

Examinations are held periodically, and a system of marking regulates the procedure for failure. Students who have failed in major subjects undergo re-examination later, or may make good elsewhere if they produce the proof of having done so. Failures in minor subjects can be wiped out by special examinations held immediately preceding the next College term. Further, special examinations are held by arrangement with the Dean and the heads of departments, success at which will improve the candidate's grade in subjects where already average marks had been obtained. The student who fails badly may be required to withdraw, but the arrangements for readmission are fair and well thought out.

Hospital Training.

This takes place principally in the Cook County, the Michael Reese, the St. Luke's, and Augustana hospitals, of which institutions the first three have already been noted (see p. xxv), and, of course, at the Research and Educational Hospital of the University. The Augustana hospital is a general hospital of about 220 beds.

The Research and Educational Hospital.—In association with the Department of Public Welfare of the State of Illinois a group of hospitals and laboratories has recently been opened, affording the University adequate facilities for teaching and investigation. The buildings occupy a campus approximately eight acres in extent, located immediately adjacent to the Cook County Hospital. The units now in operation include the following: out-patient dispensary, general hospital, research laboratory and library, pediatric ward, and the orthopædic and psychiatric divisions. The hospital has been designed to afford comfort for the patient, and the use of the clinical material. At the present time some 200 beds are occupied, but a total of 450 is contemplated for the main building (Fig. 17).

The *first* floor of the hospital proper contains the pediatric, the obstetrical, and the rontgenological departments. The *second* floor of the hospital, in addition to wards, contains the clinical laboratories, with divisions for bacteriology, serology, pathology, biochemistry, and metabolism. The *third* floor comprises eight suites of operating rooms and their necessary service rooms, with special operating rooms for head and genito-urinary work. The *fourth* and *fifth* floors contain living rooms for internes and residents and the quarters for the managing officer of the institution.

An out-patient dispensary occupies the main floor of the hospital building. It possesses large waiting-rooms, suites for all divisions of clinical work, a large amphitheatre, drug dispensary, and preparation rooms (used in conjunction with the School of Pharmacy), electrocardiographic and hydrotherapeutic units being located in the basement of the building. In addition the administrative and service offices are located on this floor. Joining the hospital by corridors leading from the basement and the third floor the University has erected a laboratory building for the science group of the medical school. Here the basement houses the photographic and plastic divisions of the illustration studios. The Department of Pharmacology occupies the first floor, Department of Bacteriology and Pathology the second floor, and the third is used by the Department of Physiology and Physiological Chemistry. The Department of Anatomy occupies the major part of the fourth floor, and the entire fifth floor is given over to the Animal Hospital, Animal Surgery, and kennels for dogs and smaller animals.

We may take the Department of Internal Medicine by which to illustrate the student's course. The work in this department, although begun in the second year, is of course mainly done in the third and fourth years. In the second year, however, the whole class of 130 is divided into small groups, so that instruction is individual, and coincident with this course the student works at laboratory diagnosis. Thus he is ready for practical clinical work in the out-patient department in the third year, when in addition to attending lectures he has the opportunity to be present at conferences and clinics. Special emphasis is now laid upon clinical work, small groups at bedside clinics being given to not more than eight students simultaneously brings about close relations between him and the instructor on the one hand and the patient on the other. Physical diagnosis will be mainly inculcated in the second year, while the work in the third year will be done in the various wards and along selected lines in the Cook County Hospital and in the Research Hospital of the University. In the fourth year, while this clinical instruction is being generally carried to a higher point, in addition to a review course of principles, optional courses in the regional medicine of the heart and chest, in diseases of the blood and blood chemistry, and in clinical parasitology are provided.

Particular emphasis is placed upon the work of the fifth year. Students are distributed among various hospitals of the country, which have been recognised by the Council on Medical Education of the American Medical Association. This work is not done directly under the supervision of the Faculty, though at several hospitals where the majority of our students take the intern year, many of our professors serve on the staff. Written reports are received monthly from reliable persons in the various hospitals concerning the progress of the work of the students. By this system the county hospitals become interested in medical education, also the students feel that during this period they are still, at least to some degree, within the influence of the University.

XII.—THE MEDICAL SCHOOL OF THE UNIVERSITY OF MICHIGAN: ANN ARBOR.

Historical.

In the University of Michigan the medical school was the first school to be established, the actual organisation being planned in 1837, and the school opened in 1850. The University may therefore be said to have developed round the school and hospital, while the latter was represented 60 years ago by a transformed dwelling-house, containing 20 beds, provided to meet the needs of a small rural community. The romantic name Ann Arbor is derived from the fact that in the immediate vicinity of this early hospital there once stood an arbor in which two ladies, each named Ann, wives of local land-owners, were wont to entertain their friends while their husbands were among the early founders of the city.

The medical curriculum expanded together with the hospital accommodation, and what had been merely a course of lectures became a scheme of education under which, first, a year's clinical experience with a practitioner was demanded, and then, in rapid succession, compliance was necessary to a curriculum of two, three, and four years. This curriculum since 1890 has undergone the development entailed by the progress of medical science, resulting in sequence and concentration in the subjects presented, abundant laboratory teaching, and frequent survey in lectures and clinics of all that is taught.

The Medical Curriculum.

Matriculation and Requirements for Admission.

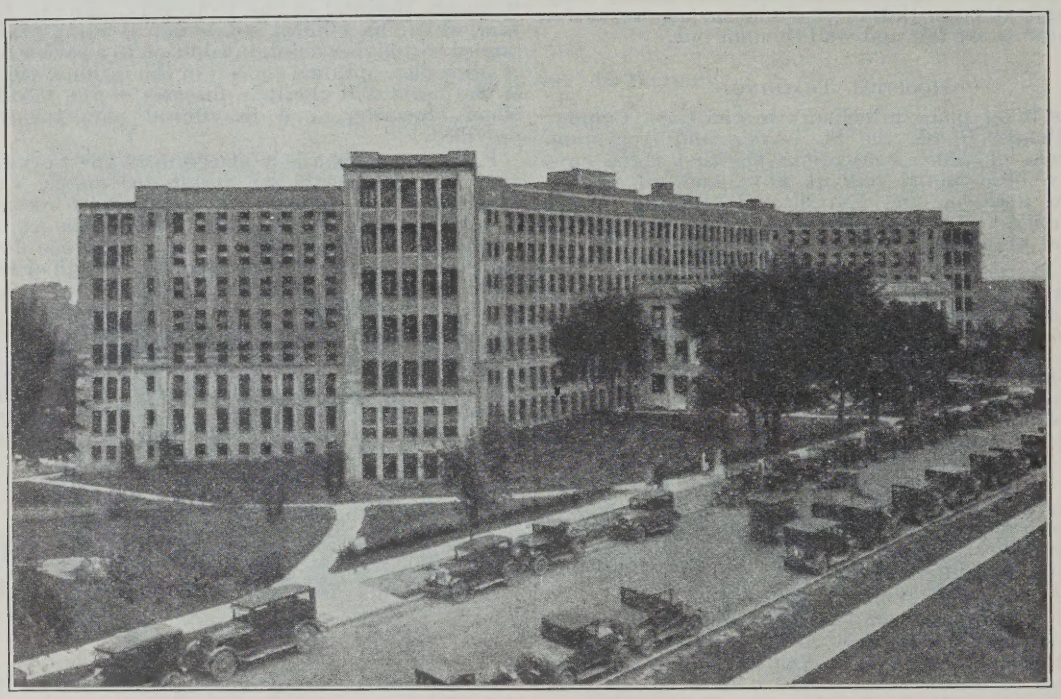
The applicant for admission to the medical school must present evidence that he has completed at least two years' work, calculated in semester hours,

in a recognised college or university, following upon a course at an approved high school. In the high school course Latin is a compulsory subject, while the pre-medical study in the University comprises, together with chemistry, physics and biology, instruction in English literature and composition, and familiarity with either French or German acquired by two years' study. A State board of registration in Michigan requies the submission to it of the credentials relating to the pre-medical study. Students may be enrolled on desiring to take a degree both in art and medicine, when a combined though rather longer course will lead to the double graduation.

chemistry, hygiene, bacteriology and pharmacology, and in the clinical laboratories. The same objective method of teaching is carried into the clinical work. During the first year the greater part of the day is spent in the laboratory; during the remaining years the mornings are devoted mainly to lectures and recitations, and the afternoons to laboratory drills, the study of methods of diagnosis, and means of treatment and clinical work.

First Year.—The subjects are, primarily, histology, embryology, and anatomy, developed into the anatomy of the nervous system and regional anatomy. Later

FIG. 18.—THE UNIVERSITY HOSPITAL, ANN ARBOR.



The number of students applying for admission at Ann Arbor is very high; as many as 1000 may apply, although it is not possible to admit more than a fraction of that number in a given year. In the course of the four years of the medical course proper the number dwindles through the falling away from the standard, but the care taken in selecting the students from among the mass of applicants is indicated in the fact that, whereas such casualties formerly amounted to as many as 15 per cent., to-day the figure is only 8 per cent. Every applicant is seen personally by the Dean, and no differentiation is made between the sexes.

SUMMARY OF STUDIES.

The clinical work is done at the University Hospital and the pre-clinical at the school, where the pre-clinical departments occupy three buildings, one of which provides ample accommodation for the study of anatomy, physiology, and bacteriology; another houses the laboratories of pathology, physiological chemistry, and hygiene; while the third is given up to pharmacology and animal research.

The medical curriculum covers four college years of nine months each. The first two years are devoted to the more strictly scientific work, which serves as a basis for the technical and clinical studies which follow. Stress is laid on laboratory instruction in anatomy, histology, embryology, physiology, physiological

in the year the subjects are physiology and physiological chemistry and bacteriology, all the subjects being presented in lectures, but worked at in the dissecting rooms and laboratory.

Second Year.—In the second year, in which the same subjects are taken up, there is a definite shaping of studies toward medical application. Anatomy is taught from the functional and surgical sides, time is given to clinical microscopy and physiological chemistry, and the study of drugs is commenced, the connexion with animal experimentation being displayed. Thus the student approaches pathology, while he is also helped to appreciate his approaching work in the wards by courses in physical diagnosis.

Third Year.—In the third year the practice of medicine in the wards and out-patient department is in full swing, the clinical work being done in the hospital of the University. Alongside of this training in the principles of surgery, medicine, and obstetrics, instruction is given by lectures and clinics in preventive medicine and in various specialties, such as pediatrics, ophthalmology, psychiatry, and neurology, oto-laryngology, and neural pathology.

Fourth Year.—The work is a development of that of the preceding year, but regular attendance at autopsies is required. The class is divided into sections, according as the particular study is in medi-

cine and surgery generally, in obstetrics and gynæcology, psychiatry and neurology, dermatology, pediatrics, ophthalmology, and oto-laryngology, a system of rotation securing a complete range of studies for all.

The course outlined leads to medical graduation, but at Ann Arbor there are combined curricula in science and medicine (B.S., M.D.), in literature and medicine (A.B., M.D.), and in pharmacy and medicine (B.S. (Pharm.), M.D.); for these combinations there are special regulations.

Examinations and Promotions.

Examinations are held in all subjects at set times. Students may be reported as having passed the course with a grade of A = Excellent, B = Good, C = Passed; or they may be marked D = Conditioned, E = Not Passed, and F = Incomplete or Absent. Students receiving a D grade are allowed one supplemental examination to remove the condition. Failure to remove the condition results in the course being reported "Not Passed." Subjects reported as "Not Passed" (E) must be taken over before the student is eligible to another examination in the same course. Courses reported as "Incomplete" or "Conditioned" (D), and not cleared within one year, become "Not Passed." During the first and second years in the medical school any student receiving two or more conditions or "not passes" in any one semester, and failing to justify the failure, will be removed from registration. During the third and fourth years the same rule applies, except that three or more "not passes" are allowed.

Lastly, no student can graduate until all his required work is complete, his conditions removed, and his examinations passed, but re-examination is allowed on fair terms and for satisfactory reasons. The curriculum is closed by a comprehensive examination which acts as a sort of sieve through which only the approved material can pass, while a fifth year is added to the course for the State licence, the time being spent as an interne.

HOSPITAL TRAINING.

The University Hospital has over 1100 beds; the hospital is owned by the University of the State, and it is understood that in consideration of their treatment the patients will be the subjects for clinical instruction. The teaching of medical students is announced in the official publication regarding the hospital as the primary object of this institution.

The hospital is placed on high ground overlooking the Huron Valley, and the main building, which has only recently been opened, offers every modern advantage of plan and equipment. The general plan, that of a double connected Y, on six storeys, provides for light wards and clinical laboratories in profusion; the first floor level is given over to a diagnostic department, where the various members of the medical staff have their examining rooms with teaching facilities supplied, and where the dispensary is placed. This out-patient department is a large one, for though Ann Arbor is a small town, it is in the immediate vicinity of Detroit—an immense and growing place. Patients are admitted to the diagnostic unit, and then from one medical service to another, until a complete diagnosis is made by the staff working as a group. A rear wing of the building houses the department of clinical pathology, the X ray rooms, and operating theatres, while a front wing is occupied by the administration.

A State Psychopathic Hospital is in close vicinity, as are buildings for tuberculous and infectious patients, and a convalescent hospital. In all these institutions, as in the main buildings, the clinical education of the student is carried on, with small rotating classes, by means of bedside instruction and conference.

MEDICAL EDUCATION IN CANADA.

I.—THE MEDICAL SCHOOL OF McGILL UNIVERSITY.

Historical.

UNDER the will of James McGill the Royal Institution for the Advancement of Learning came into existence 110 years ago, and three years later a Royal Charter was granted to the institution for the founding of McGill College, while the corner-stone of the Montreal General Hospital was laid. The interconnexion between the academic teaching of the university and the clinical teaching of the hospital was recognised from the beginning; and exactly 97 years ago the Montreal Medical Institution, that being the medical school of the hospital, was engrafted upon the new McGill University as its medical faculty. Throughout the following century during which the science and practice of medicine, as we now know them, have grown up, the Faculty of Medicine in McGill University has been a progressive and distinguished one and its graduates have been found among the advanced scientific thinkers and workers of the day.

THE MEDICAL CURRICULUM.

Matriculation and Requirements for Admission.

The medical graduate is required to take a seven years' course, two of these being pre-medical and five being directly concerned with his professional training. The candidate for admission to the first year of the curriculum must therefore prove that he has already completed two full years in some college or institution for the study of arts and science satisfactory to the University authorities, during which period he will have obtained instruction in physics, biology, and chemistry, while at the same time stress is laid upon the necessity for adequate knowledge of the humanities. Wisely, however, the authorities at McGill allow themselves a certain amount of latitude in the interpretation of their own statutes, so that they are not compelled to reject an obviously suitable candidate because in one of these subjects he may be weak. Proved accomplishment in other directions is allowed to counter-balance the temporary defect which in these promising students has always disappeared during the first month or two of professional training. That the high standard thus enjoined before admission to the first year of the faculty is fully justified at McGill is proved by the fact that over 80 per cent. of these intending adherents are already university graduates, while probably less than 20 per cent. of the applicants obtain admission. The graduates and admitted students come virtually from all parts of the world.

SUMMARY OF STUDIES.

The first year is occupied with anatomy, histology, bacteriology, physiology, and biochemistry. The next period, one of two years, is devoted to general pathology, such subjects as pharmacology and medical jurisprudence being also included. The final two years are occupied with the clinical application of this professional training—namely, in medicine, surgery, obstetrics, gynæcology, and preventive medicine. In order to qualify for the examinations at the end of each of these divisions the candidate must, of course, prove his diligence in the usual manner; he must pass in the subjects included in the first division before he can begin the work of his seventh term (that is the work in the third division); and he must pass his examination in the second division before he can proceed to the work of his tenth term, that is to say, the hospital study of medicine and surgery. In the closing examination

the subject of public health can be taken separately, but the examinations in medicine, surgery, and obstetrics must all be passed at one time, subject to certain leniency at the discretion of the medical faculty.

Examinations and Promotion.

Class examinations, oral or written, are held during the session to test the progress of the student. If the standing obtained by any student in these examinations is unsatisfactory, he is not permitted to take the *Final and University Examinations*. These are the ultimate test in determining a student's fitness for promotion or graduation, and cover the following subjects arranged in three divisions :—

First : (1) anatomy, (2) histology, (3) bacteriology, (4) physiology, and (5) biochemistry.

Secondly : (6) pharmacology, and (7) pathology and medical jurisprudence.

Thirdly : (8) public health and preventive medicine, (9) obstetrics and gynæcology, (10) surgery (including urology and orthopædic surgery), and (11) medicine (including pediatrics, neurology, psychiatry, dermatology, and laboratory diagnosis).

A student who has failed in the *Final Examinations* in any subject may apply for re-examination at the next examination period, and at the conclusion of each course he is graded in one of five groups : A (honours), B (good), C (fair), D (doubtful), and E (failure). The grade assigned to a student is based upon the tests but the record of the work done throughout the courses is taken into account and the quality of the English used by the candidate helps in determining his standing always. The rules for promotion following these tests have been summarised already, but in respect of the third or last division of the University examinations it should be noted that to qualify here in medicine, surgery, and obstetrics a candidate must have : (*a*) Attended courses extending over a period of not less than 15 terms. (*b*) Satisfactorily completed the prescribed courses of study and practice in : (1) ophthalmology, (2) oto-laryngology, (3) abnormal psychology and psychiatry, (4) infectious diseases, (5) anæsthesia, and (6) post-mortem examinations.

As has been said above, the completing tests in medicine, surgery, and obstetrics must all be passed at one time, but a student who fails in one of these subjects only may, at the discretion of the faculty, be allowed a re-examination in that subject at the next regular examination period, provided that he shall have satisfactorily completed such additional work as may be prescribed by the head of the department concerned. But the faculty reserves the right to require the withdrawal of any student at any time if, in the opinion of his instructors, he is incompetent. a promotion committee considering the cases of all students who at the conclusion of their third term are reported by their instructors as having fallen below the grade of C, in order to determine whether such students are to be allowed to continue, warned, required to repeat the course or courses, or retired from the school.

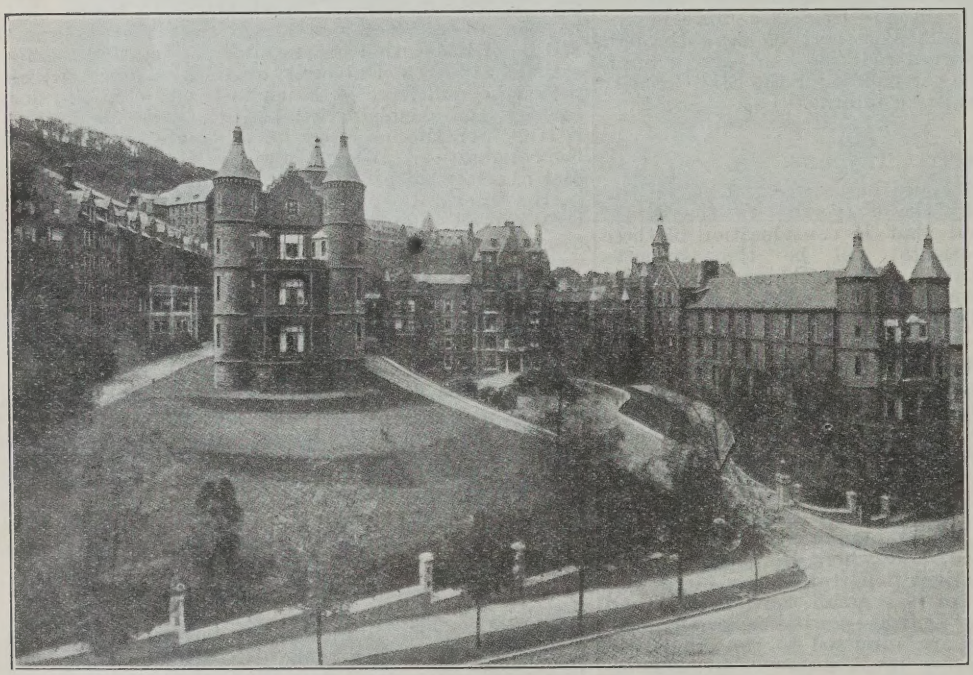
HOSPITAL TRAINING.

During the last two years the professional training is pursued in the wards mainly of the two great hospitals of Montreal, the Royal Victoria Hospital, and the Montreal General (Central Division). These two hospitals are institutions of which any city in the Empire might well be proud.

ROYAL VICTORIA HOSPITAL, MONTREAL.

The Royal Victoria Hospital of Montreal stands on a site of extraordinary beauty, and fits into its grand environment both in style and design of building, while remaining a model of practical efficiency—the beauty is there but no possible feature of utility has been sacrificed to the picturesque. The hospital is now 35 years old and owes its origin to two great and generous Canadian statesmen, Lord Strathcona and Lord Mount-Stephen, who decided jointly to build and equip an institution worthy of the future needs and importance of Montreal. This ambition was realised within one year of the project being decided upon, and in 1894 the Royal Victoria Hospital opened with 250 beds. It has now 700 beds, and the history is one of steady progression, of addition to the buildings and extension of the activities. Within 12 years the increasing demands upon the hospital's accommodation made it necessary to erect a fitting nurses' residence, while the original nurses' quarters were transformed into wards or laboratories. As with each year the pressure on the hospitals' capacity increased, new constructions were designed in keeping with the original building, and in 1916 the Ross Memorial Pavilion, containing six floors with accommodation for 120 patients, was added. This block was erected and equipped through the bounty of Mr. J. K. L. Ross, one of the hospital's governors, and is dedicated to the memory of his parents. The pavilion possesses its own operating suite, X ray, cardiograph, and physiotherapy departments. Upon its equipment no pains, either practical or æsthetic, have been spared, while in its kitchens all the cooking

FIG. 19.—ROYAL VICTORIA HOSPITAL, MONTREAL : MAIN BUILDING.



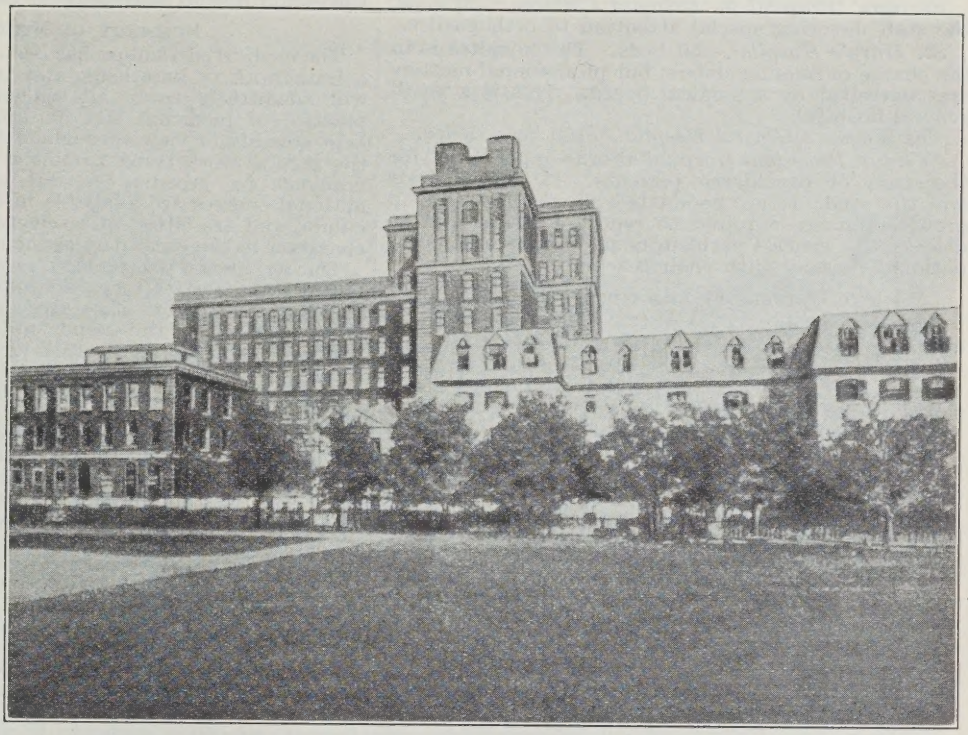
is done by the nurses as part of their training. The pavilion was opened 12 years ago by the Duke and Duchess of Connaught. In 1925 the hospital assumed control of the Montreal Maternity Hospital, which meant an addition of 75 beds to the central institution, and implied a very wise recognition of the prime importance not only to the community but to the medical students of a thorough training in obstetrics and gynæcology. The construction and equipment of this building were conceived after an inspection, undertaken by the officers of the institution, of the latest and best in similar hospitals in Europe and the United States, and the new building, which stands in the grounds of the main buildings, was opened in 1926 by Lord and Lady Byng. It constitutes a complete unit of nine floors, contains its own kitchens, stalls, operating-rooms, X ray department, and other necessary annexes. The two topmost floors provide accommodation for the nurses, and the patients' beds now number 212.

Montreal General Hospital.

The Montreal General Hospital is the senior institution, as may be shown by the fact that in 1927 it published its 106th annual report. It was founded rather as a dispensary with an infirmary attached, but a picture of the original buildings shows that by 1848 it had definitely assumed the character of a small general hospital. As a brief way of describing the progress of the institution this picture tells the story. The right hand lower portion is the original building as it was built in 1848 with certain structural alterations, while to the left stand the old medical buildings, and behind the great pathological building erected some ten years ago. Fronting the hospital is now an imposing building, completed two years ago as a residence and school for nurses, but like the Royal Victoria Hospital, Montreal General Hospital intends to progress, and judging by the plans for the future the progression implies the disappearance of the 1848 building and the completion of the pathological block by the addition of a central administrative department and of an entirely new wing to the right of the central erection. It is clear from the last annual report of the general superintendent that further extensions are contemplated, as forcible reference is made to the shortage of hospital beds felt from day to day in the city of Montreal.

The Western Division of the Montreal General Hospital, known as the Western General Hospital, is used for the treatment of acute diseases. It has 62 public beds and the post-mortem and surgical material is now being used for teaching, in which direction additional opportunities are contemplated.

FIG. 20.—MONTREAL GENERAL HOSPITAL.



The Hospitals of the Montreal Hospital Council.

While most of the clinical education of the medical students of McGill University is conducted at these two great hospitals, the Montreal Hospital Council, an association of the hospitals of the city of Montreal has under its superintendence 17 other hospitals, general or special in character, varying in bed capacity, and varying also in form of organisation. The following is the full list, and at those marked with an asterisk the medical students, in the closing stages of the curriculum, may obtain instruction.

**Alexandra Hospital.*—175 beds for the reception of contagious diseases. The students here receive instruction in the diagnosis and treatment of exanthemata.

Catherine Booth Mothers' Hospital.—50 beds. Under the charge of the Salvation Army.

**Children's Memorial Hospital.*—130 beds, with a large out-patient attendance. Primarily designed for the orthopædic cases, it now admits all varieties of patients giving the student a broad conception of pediatrics.

Homœopathic Hospital of Montreal.—50 beds.

Hôpital Français.—150 beds. General University. Semi-open.

Hôpital du Sacre-Cœur.—1500 beds. Care of incurables and of tuberculous patients.

**Hôpital Saint-Jean-de-Dieu.*—This hospital with 3300 beds is affiliated to the University of Montreal and provides a complete course of training with a special course of psychiatry. The institution has a contract with the Government of Quebec for the care of insane patients.

Hôpital Ste. Justine.—This is a private hospital with 165 beds, although it is designed to double its capacity. It is entirely a private corporation.

Hôtel-Dieu de St. Joseph de Montreal.—300 beds. General hospital.

La Misericorde Hospital.—This large hospital contains 600 beds, and although the services are of a general capacity, it is mainly devoted to the study of obstetrics and pediatrics.

L'Hôpital Notre Dame.—300 beds. Provides general services.

Montreal Children's Hospital.—Contains 50 beds, but an extension under which four times as many patients will be accommodated is under contemplation. The outdoor clinic here is exceptionally large.

**Montreal Foundling and Baby Hospital* has a capacity of 80 beds, and is designed to take care of sick and destitute children for the first two years of life. A large amount of clinical material is here provided, special consideration is given to the problem of infant feeding. Connected with the institution is a largely attended baby welfare clinic.

Shriners' Hospital for Crippled Children.—50 beds, the staff devoting special attention to orthopædics.

St. Mary's Hospital.—50 beds. The hospital is in the charge of nursing sisters, but professional matters are controlled by a medical board. This is a small general hospital.

The Women's General Hospital.—150 beds (help).

**Verdun Protestant Hospital* affords opportunity for the study of psychiatric patients. It has 630 beds and the students are conducted about the wards in groups, and are required to report on cases and to discuss the general problem of psychiatry and occupational therapy with their teachers.

The University and the Hospitals.

The association between the University and the affiliated hospitals is very close; indeed, it may be called complete, the university professors and teachers comprising the staffs of the hospitals, while in the election to those staffs the University has a predominant vote. The trustees of the hospitals, in the interest of donors and subscribers, as well as the province and city, have voices in the elections, but for practical purposes the University controls the issue. The Royal Victoria Hospital is adjacent to the medical school, and is completely equipped, as a general hospital, with all special departments; with the Montreal General Hospital the total of public beds provided for clinical study is some 700, while the beds in the affiliated institutions bring the full total up to about 2000.

II.—THE MEDICAL SCHOOL OF THE UNIVERSITY OF TORONTO.

Historical.

The University of Toronto dates from 1827, while the absorption of Trinity College, which had formerly possessed a medical faculty, dates from 1903. The medical faculty in its present form, and as an integral part of the University, dates from 1887; and, while the magnificent buildings that have now been erected in Queen's Park typify the growth and expansion of the University, they may also be taken to represent the progressive importance of the medical faculty.

The Medical Curriculum.

Matriculation and Requirements on Admission.

The Faculty of Medicine in the University of Toronto provides for a six years' course, but here the division varies from that at McGill, where there are two pre-medical and five professional, by having one year for honour matriculation, one year for pre-medical, and five years professional. The candidates for admission to the first year in the Faculty of Medicine must present pass matriculation certificates from the Department of Education of the Province of Ontario, showing proficiency in Latin, English, history, mathematics, a language, and experimental science, that is physics and chemistry; honour matriculation implies a choice of Latin, Greek, or a modern language, and one of the sciences. The faculty reserve a good deal of liberty in the substitution of subjects, the intention being merely to make sure that in addition to a knowledge of physics and chemistry up to a pass standard, the general education of the candidate is high enough to enable him to appreciate instruction in the immediate professional subjects. Candidates from the British Isles are admitted on the certificate of registration as a medical student with the General Medical Council of Great Britain, while those who possess a degree in arts from any recognised university also enter without question. Here, as at McGill University, although there is a generous appeal to other than local students, only a few non-residents can be accepted out of some 400 annual applicants, as those from the Province of Ontario are given preference in making up the entering class of about 120 students. There is reasonable flexibility in obtaining an equivalent standing by communicating to the Registrar of the University official statements of previous work.

Summary of Studies.

The medical curriculum has been designed to furnish a framework of knowledge and technical skill which will adequately equip all students for the general practice of medicine and its branches, and this is kept steadily in view throughout the whole six years, the regular work being amplified with special studies designed to broaden general education. Hence optional courses are available in the six years' curriculum, and are either of a scientific or a "cultural" character in the early part of the course.

During the *first year* biology, physics, and chemistry; during the *second year*, anatomy and physiology, histology and embryology precede the studies of the *third year* where the same subjects are developed, the anatomy of the central nervous system being especially studied, while bacteriology and elementary pathology and biochemistry are taken. The importance of the latter is recognised by three lectures a week throughout the year, laboratory courses in the Michaelmas and Easter term, and tutorial assistance one hour weekly, reviewing and supplementing the main work of the laboratory. At the end of each of these three years there is an examination, and the student cannot proceed to the study of the subjects in the following year until he has been successful in the preceding one, but there are supplemental courses to meet the case of "referred" candidates—that is to say, that a student failing, say, in one of the first-year subjects can use his long vacation by taking a supplemental course which will enable him if successful to pass on to the second year.

The *fourth year* is a critical one. The study of pathology is undertaken in academic manner, while clinical work in the wards in medicine and surgery commences. The student now receives a general introduction to pathology as applicable both to medicine and surgery, while he becomes familiar with the process of taking histories, and is instructed in the recognition of physical signs. This, therefore, is a very important year in the course, for if the student fails badly he may have several subjects in which he is required to make good in the supplementary classes. This may result in the loss of a year's study, while there is a system by which persistent failures may make continuance of the curriculum impossible. These considerations hold good in the case of the unsuccessful student also in the two last years.

In the *fifth year* the hospital instruction is in full fling, and while there is a marked difference between the procedure in the two clinical years of the British schools and those of Toronto University, the result will come out much the same. The student does not "dress" or "clerk" for a particular member of the staff, but for periods of ten weeks he receives clinical instruction from different teachers, while what is termed "theatre teaching" proceeds in clinics, and the classes are divided into small groups for clinical instruction in the wards. Bedside clinics on different types of diseases are given weekly, while the students are engaged in taking histories, examining patients, and carrying out the clinical laboratory investigation of their patients, and a weekly clinic is held in the hospital amphitheatre, at which cases are present illustrating different types of diseases. In addition to medicine, surgery, obstetrics, and therapeutics generally the specialties of pediatrics, hygiene, toxicology,

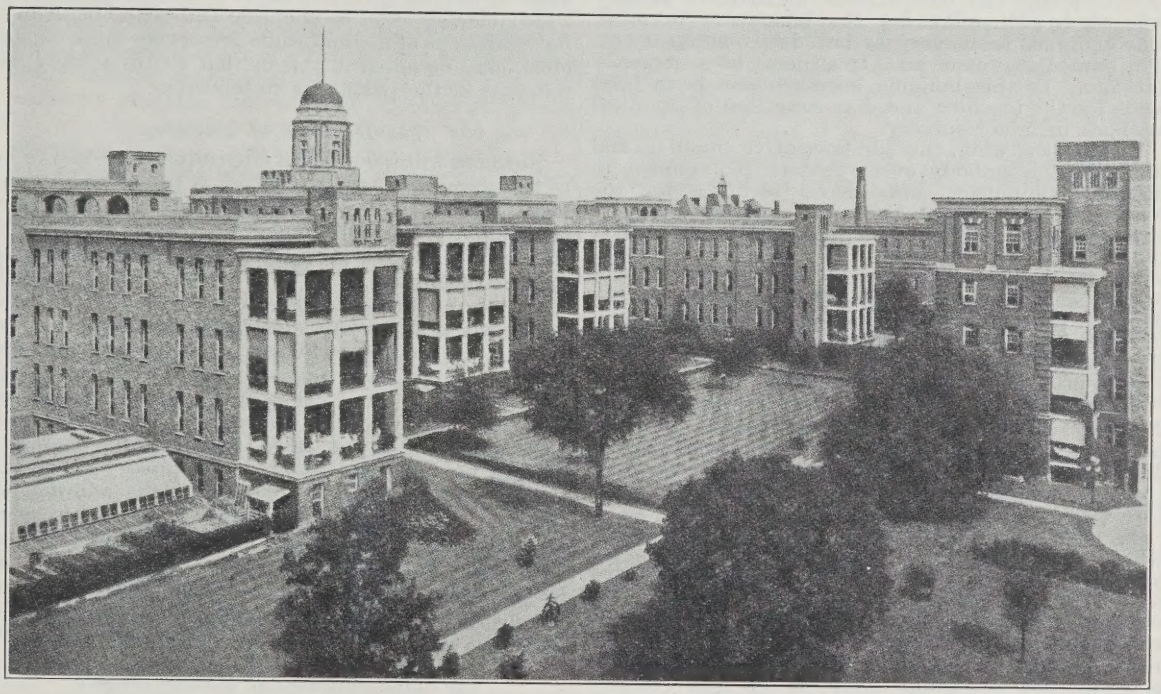
and pathological chemistry are introduced, and attendance is required at 12 autopsies. Students who have completed the work of the fifth year are also required, before commencing the studies of the sixth year, to undertake field work in public health and preventive medicine.

In the *sixth* or final year the students are placed in three groups—medicine, surgery, and specialties—and the time is divided thus: For a period of ten weeks each group devotes its whole time to clinical medicine with a similar period to clinical surgery; for five weeks to obstetrics and gynæcology; five weeks to special subjects. In this year the students have patients in the ward allotted to them, and the staff in this department, including balance, polarimeter, combustion, and experimental rooms. Above this is the accommodation for animals.

Connected with the autopsy room is a cold storage plant with accommodation for 12 cadavers, and by means of a brine circulation, refrigerators in the staff laboratories on the first, second, and third floors are kept cold. For many of the laboratories, too, there is a compressed air service.

The Anatomical Building consists of four storeys and a basement except at the north end, where there is a large lecture room, two storeys in height and capable of accommodating 250 students. Beneath the lecture room are several well-lighted and commodious rooms which are equipped as a laboratory for experimental surgery. The remainder of the basement gives ample space for the preservation and storage of material and for workshop. On the first floor are a chart room and a photographic room, and two study rooms. On the second floor is a commodious museum occupying the south end of the building, with a preparation room in connexion. Two laboratories planned to accommodate classes in histology, embryology, and neurology are also provided upon this floor, together with a second lecture room with seating accommodation for 100 students, and two demonstration rooms. On the third floor are a library, private rooms for the staff, a dissecting room, and a room for X ray demonstration. Another dissecting room is on the floor above.

FIG. 21.—TORONTO GENERAL HOSPITAL.



View of grounds—public wards.

clinical teaching suggested by these cases is provided by the staff each morning.

The Medical Building is three storeys in height in front, with an additional storey and sub-basement in the wings, which extend eastward. Two large lecture rooms are provided which flank the main edifice; the larger has accommodation for about 350 students; the smaller for about 200 students. The three main floors are arranged on the unit system, a unit room being 30 ft. long by 23 ft. deep, lighted on its long face by large windows. These rooms may be united so as to form large laboratories or may be cut in two where it is necessary. The Building is utilised for conducting the work in the departments of physiology, biochemistry, pharmacology, and zymology. In it are also the administrative offices of the Faculty of Medicine.

The Pathological Building is connected by a covered corridor with the out-patient department and so with the rest of the hospital. On the basement are the pathological museum, lecture room, and autopsy room; on the first floor rooms for the routine pathology, class-rooms for pathological histology and bacteriology, and the Department of Medical Research. On the second floor there are laboratories and rooms for the departmental library and special classes in pathology, in addition to laboratories for bacteriological and serological investigation. On the third floor are the class-rooms for systematic instruction in pathological chemistry and the laboratories for the

HOSPITAL TRAINING.

The greater part of the student's course is provided by the Toronto General Hospital, supplemented by attendance at the Hospital for Sick Children, St. Michael's Hospital, the Toronto Western Hospital, the Psychiatric Hospital, and the Riverdale Isolation Hospital.

Toronto General Hospital.—The hospital has 750 beds, and during the last year admitted to its wards 11,941 patients. The outdoor department, which has been elaborately equipped with especial attention to the requirements of teaching as well as treatment, is designed to receive and care for several hundred

patients each day, if necessity demands. Last year 67,358 out-patients were treated. The hospital is for the treatment of acute medical and surgical diseases, and the members of the staff are, in nearly every instance, drawn from the University medical faculty.

The hospital block contains ten acres, and the group of buildings includes almost everything necessary to enable a student to acquire a practical knowledge of the profession of medicine. On the south-west corner is situated the large pathological building, which is also an integral part of the hospital. In it are found the pathological, clinical, and chemico-pathological laboratories, as well as the autopsy room and the museums. The Pathological Building is regarded as one of the most complete in America. There were 304 autopsies during the year. North of the pathological unit is found the out-patients' department already referred to; then follows the emergency hospital, fully equipped with every modern device necessary for the immediate care and treatment of emergency patients. In this building arrangements have been made for the teaching and demonstration of practical methods in minor surgery.

The medical wing, the administrative building, and surgical wing embody every modern requirement in hospital equipment, and special facilities for the student are provided. Twelve operating rooms are to be found in the different surgical sections. South of the surgical wing is located the obstetrical hospital with 80 beds. The number of births in this department last year was 1332. To the X ray department more than 100 patients a day are sent in for examination, and complete courses are given to the students in X ray work. A well-equipped hydrotherapeutic department is connected.

Hospital for Sick Children.—This hospital, with 262 beds, has been remodelled and a large new wing has been built on the west side of the present building. These alterations and additions include new operating theatres, out-patient department, pathological laboratories, and wards for infectious cases.

St. Michael's Hospital.—This is a general hospital where medical, surgical, and obstetrical cases are admitted. The number of patients admitted last year was 4710, while 40,282 cases were treated in the out-patient department. There were 462 births in the obstetrical department. The accommodation has been enlarged by the addition of a new wing, so that there are now 383 beds.

Toronto Western Hospital affords excellent opportunities for clinical study. There is an outdoor service where dental, tubercular, surgical, medical, gynæcological, and special clinics are held. Two large operating theatres are provided and there are four public wards for clinical teaching.

The *Toronto Psychiatric Hospital* receives mental and nervous patients from the City of Toronto, especially milder types, for short periods of observation and treatment, and determines the best method of disposal of other cases which may not be suitable for admission to the hospital. Persons coming before the courts and suspected of having mental disability are remanded to the psychiatric hospital for observation, on the basis of which disposal is determined. The activities of the hospital are closely affiliated with those of other hospitals, with the psychiatric service in the public school system, with the juvenile court, and with the local and national committees in mental hygiene and the various social service organisations in the city, in linking together public health activities in the field of mental hygiene. There is accommodation for 30 male and 30 female in-patients, there being on each ward 20 beds in open wards and 10 single rooms.

Both in the out-patient department and in the wards opportunity is provided for instruction in psychiatry for students in the later years in medicine.

Riverdale Isolation Hospital has 375 beds where the study of the diagnosis and treatment of acute infectious diseases can be carried on. It is under the authority of the Local Board of Health, and the direct supervision of the medical officer of health of the city.

SOME REFLECTIONS.

As was indicated in the preliminary statement, the general pattern of medical education in the United States and Canada bears a strong resemblance to that prevailing in this country, where, however, closer homogeneity results from the existence of one body, the General Council of Medical Education and Registration, which has controlling powers. The details given in the sections dealing with the 14 medical centres which were visited show sufficiently that everywhere in the United States the attempt is made to provide for the medical student an education which should alike be scientific and of public utility, but variations of method, while preserving this common ideal, may be noted in this or that centre as they are reflected in the particular statements.

The Duration of Training.

Nowhere will the medical curriculum be found to be of less duration than that which is prescribed by our own General Medical Council, and for the most part the training is actually longer. In those cases where the medical course proper only lasts four years, as against the British term of five years, it will be seen that the pre-medical education, necessary to gain admission to any school, demands a knowledge of the fundamental sciences—that is, chemistry, physics, and biology—and that in only one case is the course, as far as these pre-medical subjects are concerned, of less than two years' duration. So far as this pre-medical course is concerned with scientific subjects it may be taken to represent the first year of the British medical curriculum, so that the addition of the four years' medical training in applied science and clinical work brings the whole professional curriculum to at least five years. No curriculum of less duration than this would be sanctioned at any of the medical centres which aspire to be considered of first-class standing, such as those that were inspected.

The Standardisation of Medical Schools.

And it may be pointed out that for many years a process of purging has gone on in the United States under which the inferior medical schools have been eliminated in a thorough way. As recently as 1906 there were 162 medical schools in the United States, and the training received by the students at some of these places was of a sort to bring all medical education into ridicule. The doctors in the United States suffered at home by having within their medical body members whose scientific and clinical attainments were very poor; and they suffered abroad by finding that claims to recognition by their own citizens in foreign countries were not admitted. This state of affairs, which in certain places had become a scandal, is now largely remedied, and to-day but 80 medical schools exist, and these have been submitted to a scheme of category under which only 72 are placed in the first class.

A system of education now prevails in the representative centres which is generally of a high standard and is carried on over a period which should certainly be long enough to enable the student, when graduation is reached, to serve his calling in accordance with public claims and assist in its scientific development. But it will be noted how great a stress is laid in the medical schools of the United States upon the amount of time that the student spends upon the various subjects of study, a stress that is entailed by the absence of a general system of examinations as we

understand examinations in this country. Where, as with us, the students of all the medical schools are assembled at regulated intervals to meet the common tests imposed by their universities or their corporations, the result of their training is all that they are asked to display, the question of how they were trained playing no part in the tests. The examinations have been standardised by a central authority, and periodical inspections by that authority are held in order to ensure that the standards are lived up to. Our Royal Colleges, whose diplomas, in one division of the country or another, are held by the great majority of our doctors, examine students coming from every medical school, ensuring that from the mass of the student material qualified men are drawn who can show a common and good level of accomplishment. This level, moreover, is not threatened by the multiplication of university medical Faculties which has been a recent feature in medical education, for, first, the university students receive their training at schools that are also training men and women who are not connected with a university, and, secondly, the university students in most cases acquire the College diplomas. To-day with us a doctor is a doctor and, save where the possession of an honours qualification is needed for the holding of an appointment, the particular affixes to a name in the Register have no significance.

The Rôle of External Examinations.

In the United States and Canada the rapid but unequal rises in culture, which are inevitable in the expansion of young countries, make any such centralisation impossible for the present, with the consequence that the medical students from one centre are not associated with those from another centre by meeting any common tests of knowledge, whereat they would display the results of the training received at their various centres to external examiners. Consequently the responsibility of deciding what man or woman is or is not fitted to become a member of the general body of practitioners, for the good alike of the public and of our calling, is placed upon the educational authorities of the individual school; and these authorities, in their character of internal examiners, bring to their assistance a close inspection of the conditions under which the work of the students is done, while regarding the examinational outcome of its doing. Hence the student is asked to occupy his time in certain ways, and this in such detail as to make it believed sometimes that the hours spent over a course can be correlated with the successful acquisition of knowledge. The authorities of the schools are well aware that such correlation can never be an accurate one; but insistence in the educational schedules upon proofs that a fixed time has been spent by the student in this or that direction helps to take the place of a system of external examiners, which cannot as yet be devised as a practical policy.

The Common Pattern Displayed.

At the 14 first-class centres visited the training proceeds in the usual three stages—i.e., it is concerned with: 1. Purely scientific subjects (in the United States and Canada taken in the act of matriculation). 2. Scientific subjects directly applicable to medicine—namely, anatomy, physiology, and biochemistry. 3. Pathology, or the variations from those normal standards with which work of the second period has familiarised the student, as they become related to clinical procedures at the close of the curriculum. The way in which these three stages are divided from one another at all the schools is that with which we are familiar in this country, but we find more attention is paid in the Western curriculum than in ours to the need for continuity. The order in which the subjects are presented to the American medical student varies from that at our schools mainly in the wish to preserve a sequence, the student being introduced to pathological and clinical work when he would not be considered with us sufficiently informed to benefit by such studies, or receiving lessons in psychology while learning histology. Every educational course has to consider numbers and not individuals, and it may be that precocious information fits the mind of one student while bewildering that of another. Hence criticism of any scheme, that at one place it is too fast or that at another place it is too slow, or too much planned in water-tight compartments, is not safe. We have here a real problem for the educationalist, but unluckily his opinions should be based upon evidence which he can seldom obtain, for he should be able to compare the success in after-life of large groups of students, starting their work at the same time, but pursuing it at different schools. In the United States such a big personnel appears to surround some of the principal teaching centres that an inquiry into the matter might well be started.

The Student Material.

The schedules set out in the preceding pages suggest on the face of them that the medical students of America and Canada form a more highly selected material than our medical schools obtain, for almost invariably it is remarked that the number of applications to enter any medical school exceeds by 5, 10, and even 12 times the number of those for whom admission can be found. The figures cannot be taken at their superficial value, if only because the rejected at one centre become the accepted at another. The reports that great numbers of students are being turned away from medical schools, while true in a sense, greatly exaggerate the situation, as can be seen from an investigation made two years ago by Dr. B. D. Myers,[1] whose figures showed that sifting processes resulted in the admission of the better element and the rejection only of a proportion of students less well qualified, so that the regulations for admission to the profession are not the deterrents that they have been thought to be.

The rejection of applicants for admission is carried out by strict scrutiny at all the 14 centres visited, and this procedure is entailed upon the authorities by the fact that the training of the accepted students will lie entirely with them; they will teach them, will promote them or suspend them, and will adjudicate upon their fitness for graduation without appeal to any but individual instructors. The sense of responsibility, thus implied, is displayed at the beginning by ascertaining all that is possible about the student. At the different schools different demands for information are made, but in addition to the production of credentials in proof of the quality of pre-medical education, all the schools expect some personal knowledge of the character and general make-up of the applicant, and at some a personal interview with the dean is required. The close relations thus opened up between the dean and the student are imitated in later phases of the curriculum by the association that occurs between the student and his teachers. Not only, considering the size of the institutions and the number of beds in the hospitals, is the total number of entrants to these schools each year light in proportion to the material opportunities for medical

[1] Myers, B. D.: Bulletin A.Am.M.Coll., April, 1927, ii., 97 July, 1928, iii., 193.

education, but this total comes soon to be split into groups so small that every man obtains what amounts to individual instruction, while the value of his work is watched and reported upon with a view to his place in some category of merit whereon his promotion will depend. It follows that in every stage of his career the way that the student does his work, as well as the outcome of that work, is being taken into account, a condition that cannot occur when the issues are being practically determined by external examinations.

The Examinational Test.

The most striking difference between the medical educational course in America and Canada and that in the United Kingdom is the method at which the teaching authorities arrive at their conclusions as to how far the students are benefited by their training, and how far they are fitted for the service of the public as qualified medical men. Absence of anything corresponding to formal examinations of students at regulated times is replaced by a sifting process that is always going on; and, save for the post-graduate procedures to obtain a State or Provincial licence, there are no external examiners.

Many in this country are found saying that the examination system with us is overdone, and the fact that the duration of a curriculum which is five years by statute is over six years in reality supports the largely held opinion, while this is strengthened whenever the results of some particular examination present a strikingly high average of failures among the competitors. The possible over-loading of our curriculum, accompanied by redundancy of examinations, has received the serious attention of the General Medical Council, but the difficulty for the Council of making the path of the student smoother is aggravated by the fact that there is at least as much pressure brought upon the Council to add to as to subtract from the compulsory schedules. As our art and science enlarge their boundaries many persons, in the spirit of true progress, desire that those developments should find representation among the questions of examiners—in the words of a popular sport, they desire to stiffen a course, which already appears too hard, by the lengthening of certain of the holes or by the provision of more obstacles. That difficulty is met both at home and abroad by the institution of post-graduate opportunities; but while post-graduate instruction is an extensive and well-organised affair in the United States, and while in Canada similar tendencies are manifest, in Great Britain the outcome of much talking has not been proportionate.

What things can safely be left to a post-graduate stage is to ask at the end of the educational curriculum the question which already exists at the beginning—namely, where the line should be drawn defining the medical course. Several of the American universities appear to provide an eight years' course, the total being arrived at by adding four years of pre-medical study to four years of medical study, and many of the schools insist also on a year's residential work before graduation. With our own pattern this course of eight or nine years becomes five years by deciding that of the four years of pre-medical work only the equivalent of one year is necessarily allocated to the study of chemistry, physics, and biology. But such simplification cannot be pursued all along the line, and at several of the American universities it would be impossible under their printed regulations; so that we see that the real place where the medical course proper may be said to start, taking all three countries into consideration, is not exactly certain. Turning to the other end of the curriculum we find that at some of the various centres noted there is much stress laid by teachers upon the knowledge displayed by the students along special lines; indeed, to many British teachers there must appear to be the risk here of a too early and easy detachment of the student's intelligence from the general in favour of the particular. Those who hold this view will also feel in respect of the British curriculum that attempts to add compulsory subjects, whose study must be covered theoretically in five years to the satisfaction of examiners, are on the wrong track, and that post-graduate training is required to meet the case.

In all cases in the United States the students are examined, as far as graduation is concerned, by their own teachers at their own centres, and the personal knowledge by the examiners of the kind of individual student they have before them influences the decisions. The sifting of the men in the pre-medical stage does not prevent a large proportion of the students from dropping out before graduation. The facts are recorded in a card-index of the Students' Register kept by the American Medical Association, from which it is learned that about 90 per cent. of all students who failed to graduate dropped out in the first two years of the medical course. "If, for scholarship or other reasons," says the *Journal of the American Medical Association*, "students are not qualified for the practice of medicine they should be notified in the earlier years so their time may not be wasted by vain attempts in the higher classes, only to be dropped after they have come so much closer to graduation. This not only adds extremely to their disappointment, but also prevents them from making a better use of their time in some other line of human activity."

These words form the most substantial argument against a completely external examinational system; such external tests cannot take note of much that counts, and time is wasted in vain effort. The fact that we possess here in the General Medical Council a single controlling authority functioning under the Privy Council to settle the standard and conduct of examinations makes possible our large and almost complete system of external examination, though there are signs that the internal examiner is gaining in influence with us. The institution of such a body in the United States is quite impossible along similar lines for the individual States could not be found surrendering so many privileges which now accrue to them, nor in Canada are the Provinces ready either to form a central body for themselves or to sacrifice their own initiative sufficiently to fall under the ægis of the General Medical Council.

Licences to Practise.

One consequence is that the various States and Provinces institute for themselves separate schemes of examination according to which separate licences are issued for legal practice in particular divisions of the countries, and here it may be said the principle of external examinations at last shows itself. The students will have graduated to the satisfaction of tests applied throughout their curricula by their own teachers, but to obtain the State or Provincial licence they have to satisfy boards of external examiners. These boards are of very different constitution and the form of examination instituted varies with each State or Province, although there is in America a central board of federal character whose examinational tests are accepted at certain of the larger or older States. It is outside the scope of these notes to comment further upon the licensing process in either

of the countries, but mention is made of its existence because examining boards instituted under it are sometimes alluded to as a proof that external examination is not so entirely unknown as one is usually led to believe, and that even a central body exists. In truth these examinations have almost nothing to do with the educational course of the student proper; the fact that they have to be passed has little or no influence upon the training which the student receives, though occasionally the statement is made, in connexion with the subject of hygiene, that in the tests for licences acquaintance with some of the topics which fall naturally under this heading will be expected.

FIG. 22.—UNIVERSITY OF CHICAGO: FIRST UNIT OF HOSPITAL GROUP.

The Hospitals and the Universities.

Next to the absence of a recognised system of external examinations at regular periods the most striking difference between the educational courses in America and Canada and the conduct of undergraduate training in the United Kingdom is produced by the fact that the schools where the students are trained are integral parts of some university system. Accordingly many of the hospitals at which the clinical work is done are not in their general constitution analogous to the great medical charities whereat our medical students are educated. In the excellent presentation of hospital data made by the Council on Medical Education and Hospitals of the American Medical Association the hospital service in the United States is divided in accordance with the standing of the institutions, or as the hospitals are centres for general education, or for the training of residents in connexion with a fifth year of the medical course, or according to whether the type of service rendered is general, special, and so on; further, the service is also classified according to "ownership or control." Under this heading hospitals may be subdivided as Government owned, as having certain educational functions, as publicly provided, as independently organised, or as belonging to religious denominations, fraternities, or industrial corporations. Certain States have built large hospitals, generally in connexion with a State University, to serve the double purpose of caring for the sick and injured throughout the State and to afford teaching material for the medical Faculty of the State University.

Examples will be found in the notes upon the different hospitals in the United States and Canada where the students receive their clinical training, of institutions which belong sometimes entirely to a university, sometimes entirely to a municipality, and occasionally entirely to a State. Now in so far as proprietorship brings with it privileges as well as responsibilities, it is clear that the appointment of the medical staffs of these institutions must be made on varying principles in accordance with the constitution of the institutions. This is a matter which has to be kept before our minds when the question arises as to the inter-connexion between a teaching hospital and

a university Faculty; it is a vital matter when we are considering medicine as a fit province for purely academic training in the manner that, for example, it is being considered at the University of Chicago (Fig. 22, and p. xxv). These large issues are not, of course, under discussion, but it is pertinent to point out that neither in the United States nor in Canada any longer can a first-class medical education be obtained save through a university school, even though that university may be incomplete in its number of Faculties.

A simple way of looking at this situation is to recall the historic connexion in our own country between the hospital and the medical school and then to look at the will of Johns Hopkins (see p. xxi). With us the medical school arose as a part of the hospital as far as the clinical departments of medical education are concerned; and when the schools arrived little but clinical facilities were contemplated. Thus, and quite literally, the hospital owned the school, and the authorities of the hospital made the appointments to the staff of the school as they did to the staff of the hospital. And these things remain so to-day in the main, though, as is well known, the introduction of the university element has now been effected. With us connexion with a university is no part of the original constitution of the hospital, while the students from universities who use the hospital medical schools do so upon terms—i.e., they pay for the training which they obtain at these large charities because the university, under whose provisions they intend to graduate, requires from its alumni knowledge in certain provinces where only a hospital can afford it. The principle laid down by Johns Hopkins envisages an entirely opposite position. The university enters as a senior partner, owns the hospital, and admits to the wards its own hospital students of its own school. A striking difference at once occurs in the staffing of the hospitals, for while with us the university teachers are not necessarily members of the staffs of the hospitals, in America and in Canada, speaking generally, the hospitals are staffed by the university professors. No difficulty whatever can arise about this when the university owns the hospital, while where the State owns the hospital the views of the State and the university are easily made to coincide as to the elections to the staffs. Where universities use the wards of great municipal institutions the situation is not always so simple, but at the huge hospitals visited at the 14 medical centres in the United States and Canada working arrangements had been made upon harmonious plans.

In Conclusion.

In conclusion, there is made no attempt to formulate conclusions, for a limited and quick survey of large things, involving estimates of academic ideals and of material plant alike, could result in nothing of the sort that would be useful. The wish has been to afford the information necessary to appraise how far the standards of medical education at a group of representative medical schools in the United States and Canada approximate to the standards in Great Britain, and to indicate the main differences so that measures of reform on both sides might be helped by making comparisons.

Many hold that in this country our examinational system is too rigid, while many thinkers in America and Canada regret the absence of some such machinery. With us to regard the hospital as an adjunct to university education is a view that has met with no general acceptance, though the advisability of establishing a close relation between the work of the ward and that of the laboratory is acknowledged; in America and Canada the medical school is an integral part of the university which controls the teaching given in the hospital. Here are two fundamental divergencies worth inquiry upon common grounds.

The story of money on the two sides of the Atlantic is not the same, but no one can say that the one or the other side is wholly at an advantage. The advance of medicine and medical education, in America particularly, is accompanied with a riot of expenditure; dollars seem to flow there as naturally for hospitals and laboratories as gold flowed in mediæval Europe for the great cathedrals; yet all this expenditure in a comparatively new civilisation may not be well directed, and, indeed, may have the danger that accompanies too rapid growth. We have, for our part, too little money but greater experience and greater right to rely upon precedent. Yet for these very reasons we may be too reluctant to adopt measures that would bring about progress.

Nothing but good can come from the endeavour of the great English-speaking peoples to understand each other on such matters On both sides of the Atlantic a simple chant may be heard to the effect that "the more we get together the happier we shall be." In reference to the calling of medicine the jingle is true, and *pourparlers* now taking place through the General Medical Council are concerned with practical measures of a coöperative sort.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, No. 423, Strand, and No. 1, Bedford Street, Strand, in the County of London, and printed by HAZELL, WATSON & VINEY, LD., 52, Long Acre, W.C.2.—Saturday, JAN. 5, 1929.

THE LANCET

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

Telegrams—LANCET, WESTRAND LONDON. *Telephone*—GERRARD 4314 & 4315. *Offices*—423, Strand, London, W.C.

No. XIII. OF VOL. I., 1929. No. 5509. Vol. CCXVI.

LONDON, SATURDAY, MARCH 30, 1929

Founded 1823. Registered as a Newspaper. Published Weekly.

Pp. 112—Price 1s.

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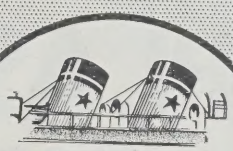

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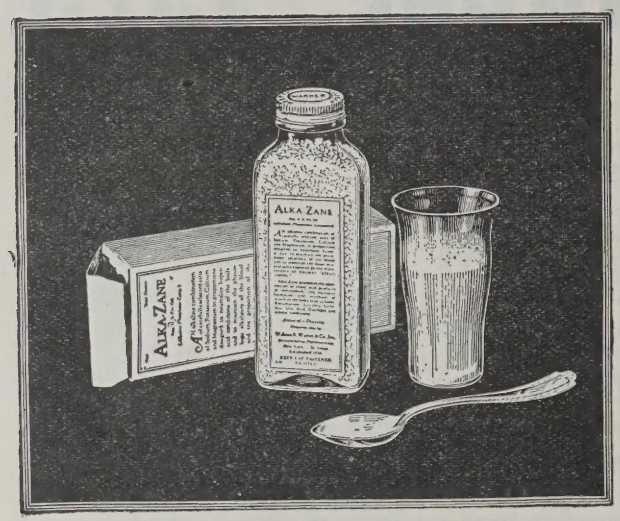

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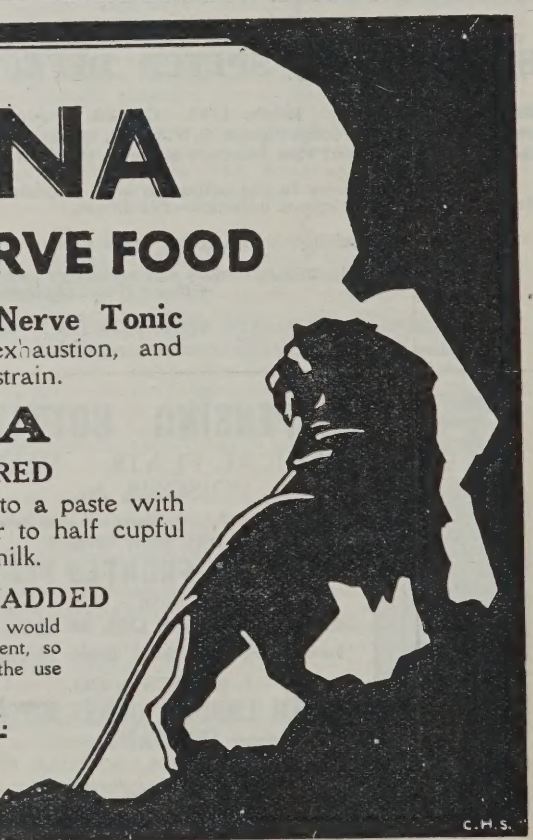

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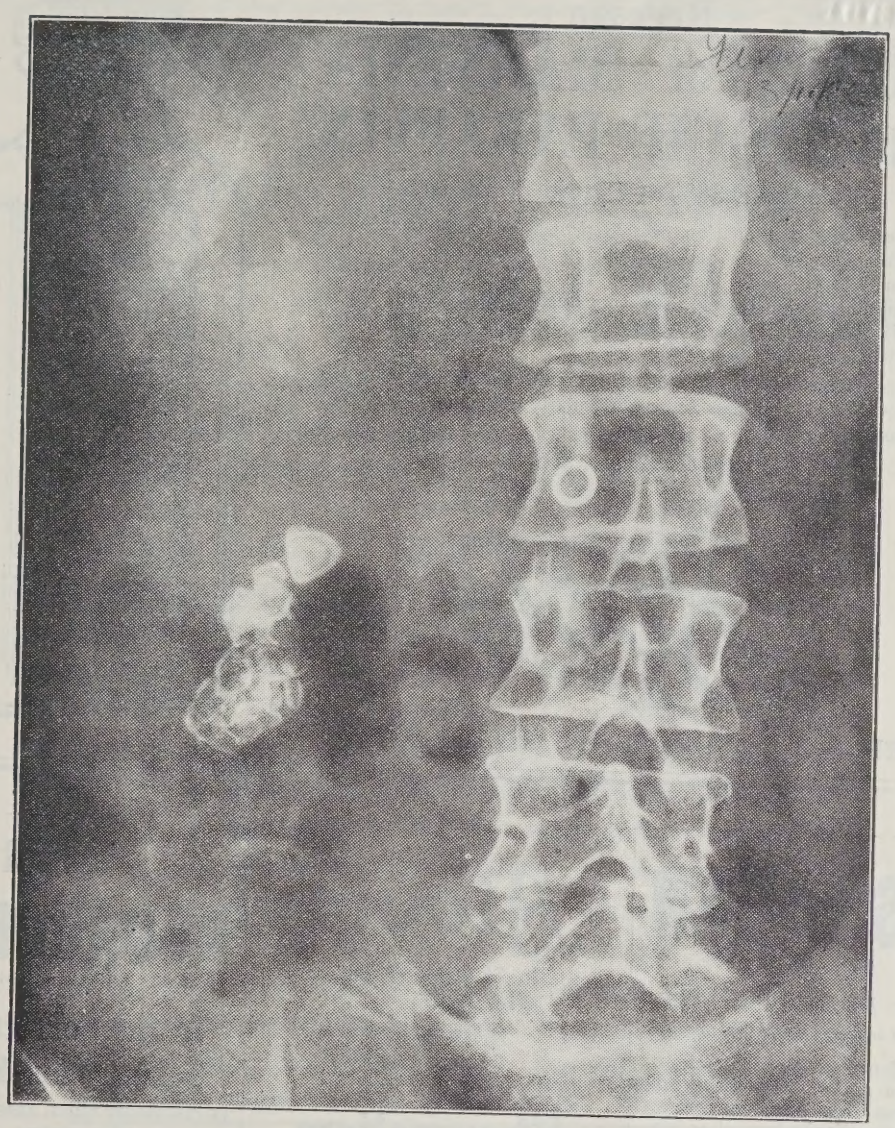

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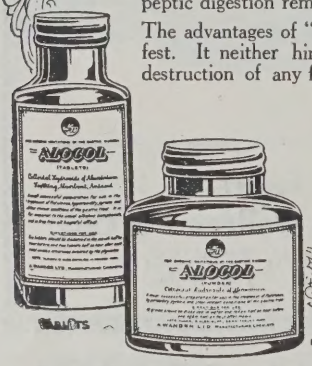

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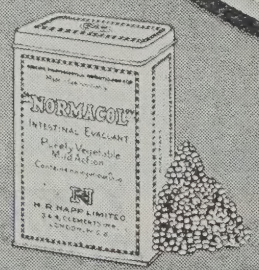

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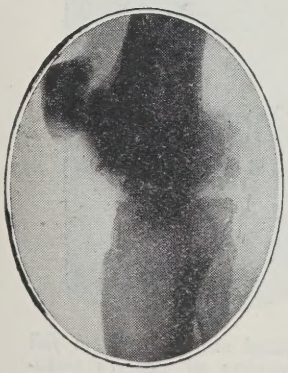

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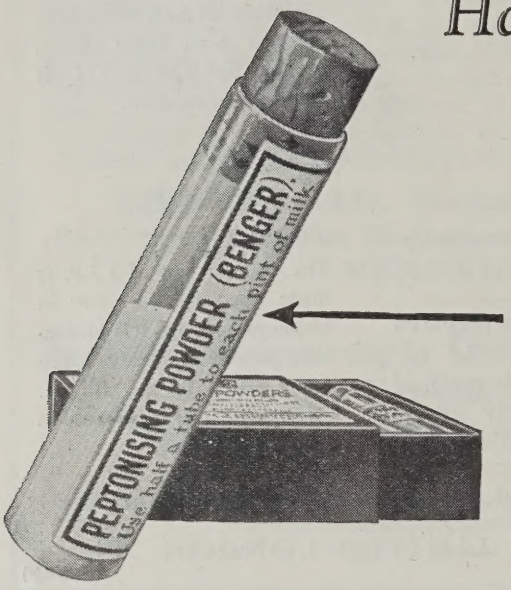

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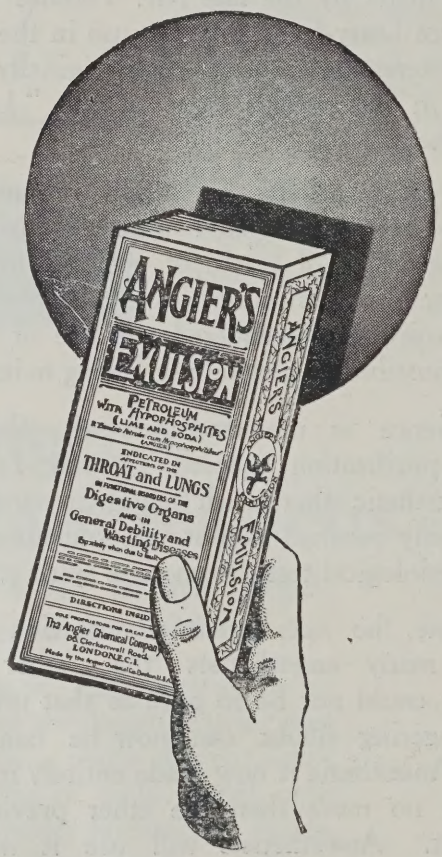

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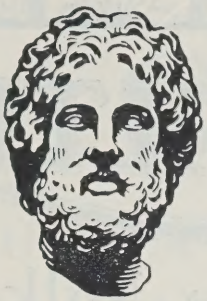

(*Aesculapius*)

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The choice of pluriglandular formulæ for the various conditions in which organo-therapy is indicated is often difficult. There may be a considerable difference of opinion as to dosage, and physicians may from their practical experience decide something quite definite but which is probably not in accordance with the usual formulæ.

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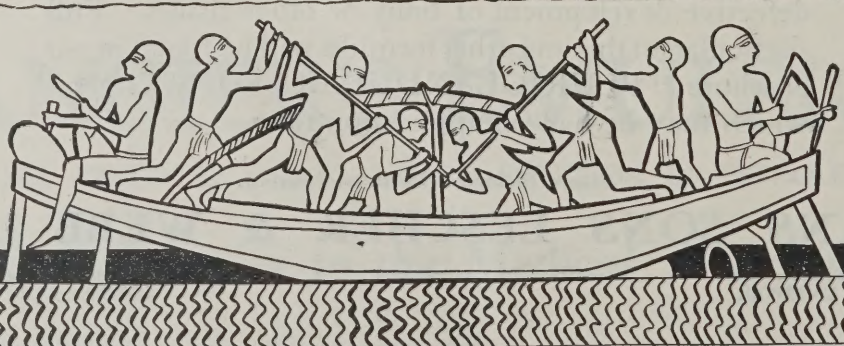

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Supplied in packages of 24 vials.
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Crookes Colloidal Aluminium Hydroxide
Antacid without evolution of gas and mildly astringent
Directions for use:
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One to two teaspoonfuls in water half an hour before and an hour after meals or as directed by the physician.
AS A MOUTH WASH—
One to two teaspoonfuls in a wineglassful of water.
SHAKE THE BOTTLE.
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A Colloidal combination designed to diminish hyperacidity and absorb intestinal toxins.
Each teaspoonful contains approximately—
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One to two teaspoonfuls to be taken in water three times a day after meals, or as directed by the physician
SHAKE THE BOTTLE
COLLOSOL
LACTALUMINA
Crookes Colloidal Aluminium Hydroxide
Antacid without evolution of gas and mildly astringent
Directions for use:
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Also combined with Bismuth for counteracting those cases of stomachic disturbances marked by recurrent diarrhœa.

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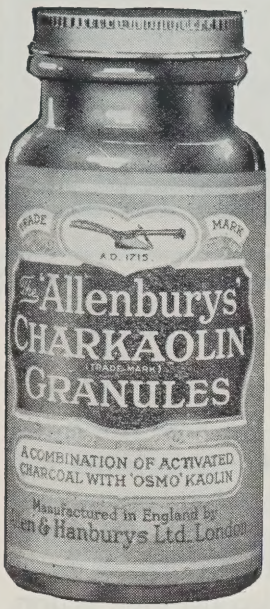

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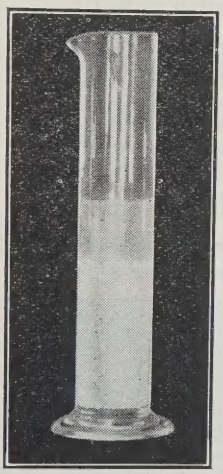

A Showing the heavy curd formed by the action of gastric juice on ordinary cow's milk.

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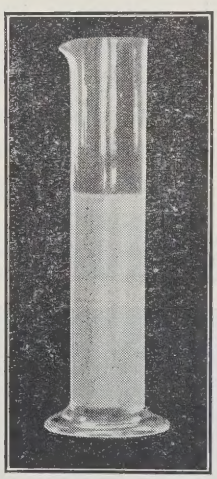
In tins at 2/1, 4/- and 7/6.



B Showing the finely flocculent curd formed by the action of gastric juice on the 'Allenburys' Diet.

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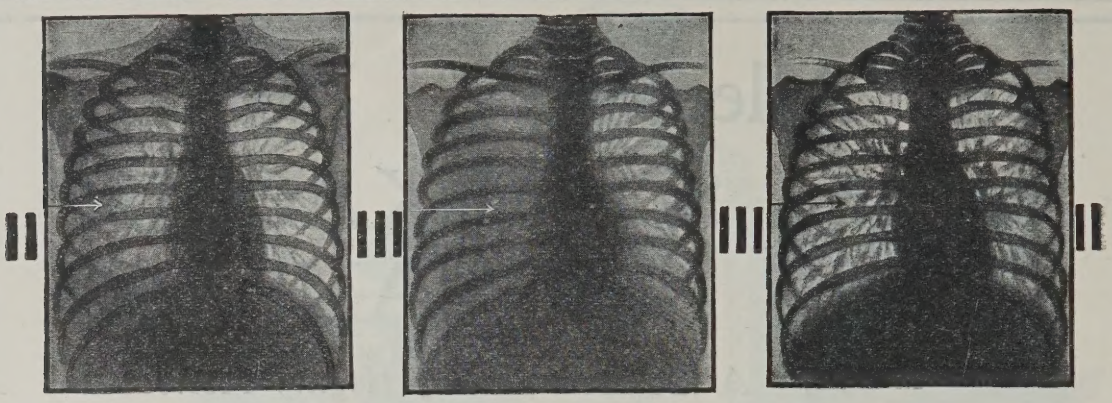

Which Type?

PREBLE points out that "of all the diseases which may be classified as typical, none is truer to its type than the pneumococcus pneumonia". The treatment of pneumonia, *whatever the type*, is essentially symptomatic. And symptomatic therapy is *necessary* in pneumonia, first, because it is not always possible to combat the *cause* of the disease effectively, and, second, because it is necessary to correct functional faults and to stimulate functional deficiency, both of which determine the course of the infectious process to a large extent.

Whatever the type—

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Applied as a jacket over the entire thoracic wall, Antiphlogistine will serve to allay the painful pneumonic process, facilitate expectoration and ease the efforts of coughing. By virtue of its marked decongesting action, it sustains the vasomotors and the circulation, decreases toxemia and, being thermogenetic, assures a maximum of comfort with a minimum of disturbance to the suffering patient.

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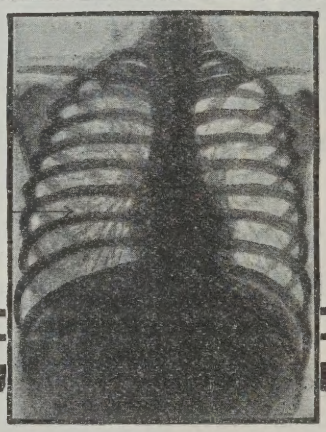

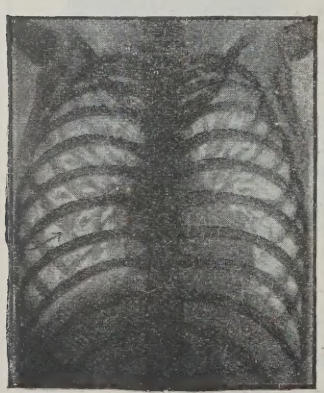

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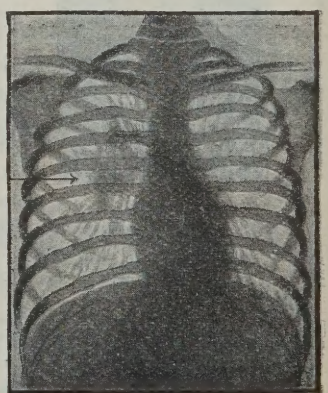

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Reference : The Therapeutic Application of Acetylcholine.—THE LANCET, 9th MAY, 1929.

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Literature and Samples on request

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IN THE TREATMENT OF PUERPERAL FEVER

Since January, 1924, M. Riviere (Gaz. Hebd. Sci. Med., January 6th, 1929, p. 2) recommends the use of arsenic salts in the treatment of puerperal fever. Encouraged by good results he has, since 1925, aimed at the prevention of puerperal fever by the same means. Arsenic has been given in all cases in which fever might be expected. Riviere's figures for four years are 3,667 accouchements with only three deaths, giving a mortality of 0.08 per cent. ; of this number, 169 were definitely septic, though in varying degree. Among them were women who had had multiple interventions before admission to hospital, frequently without aseptic or even antiseptic precautions. The author has now arrived at a systematic method of treatment : at the first rise of temperature of genital origin, without waiting for absolute clinical confirmation, arsenic is administered ; subcutaneous injections of Sulfarsenol proved most satisfactory. For treatment 0.12 to 0.18 cg. in severe cases was given ; this dose was repeated from one to nine times according to the resistance and the gravity of the infection. For prevention 0.06 to 0.12 cg. was found to be adequate. Out of 53 important operations, treated on such preventive lines, in 7 cases there had been infection, and there had been only one death.

EPITOME OF CURRENT MEDICAL LITERATURE.—*British Medical Journal*, Feb. 23rd, 1929.

Literature on Sulfarsenol and a copy of " The Treatment of Puerperal Infection with the Salts of Arsenic," by Prof. Maurice Riviere, gladly sent on request.

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LIVER EXTRACT

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Clinical reports continue to present evidence of the prompt response to the administration of 'WELLCOME' LIVER EXTRACT.

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In tubes, each containing an active selected fraction of an extract derived from half-a-pound of fresh liver.
DIRECTION.—The contents of one tube, or more, daily, in soup or water, or as directed by the physician.

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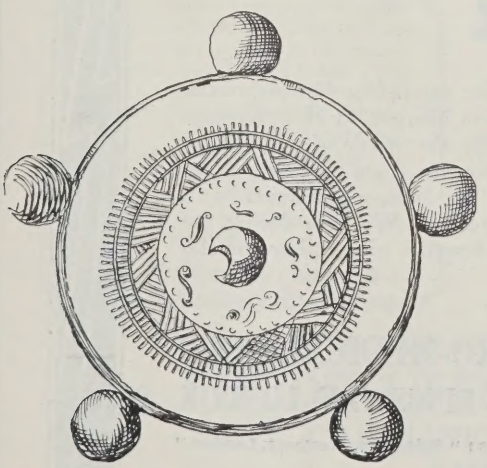

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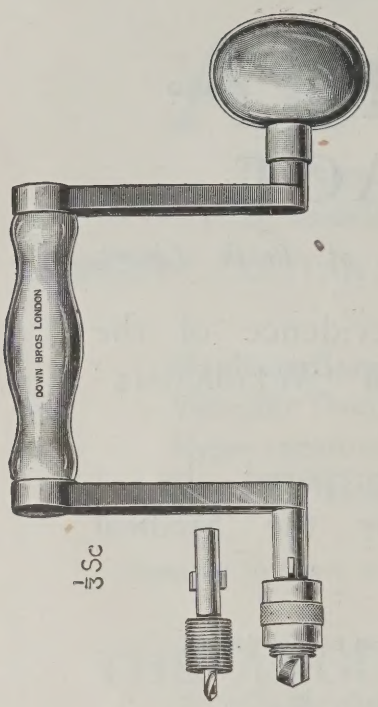

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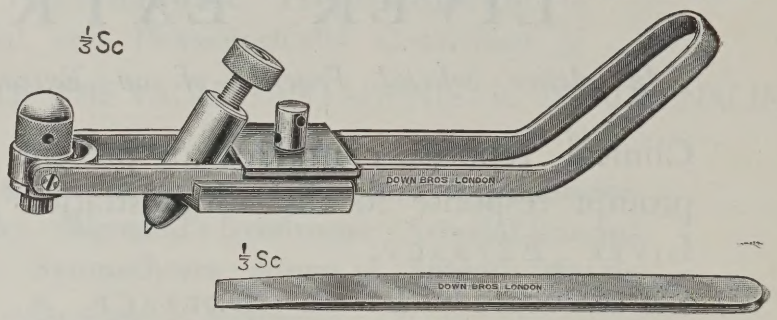

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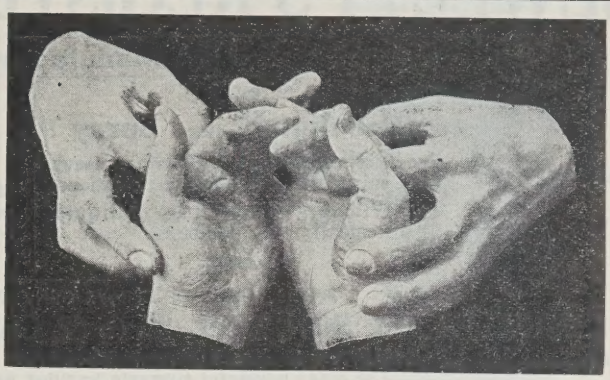

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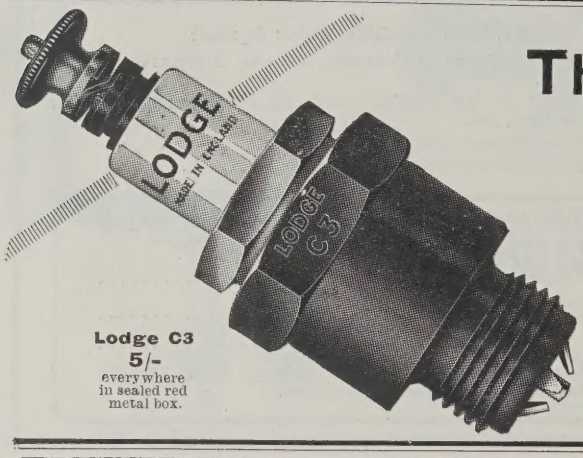

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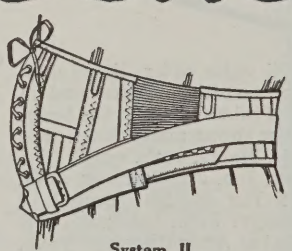

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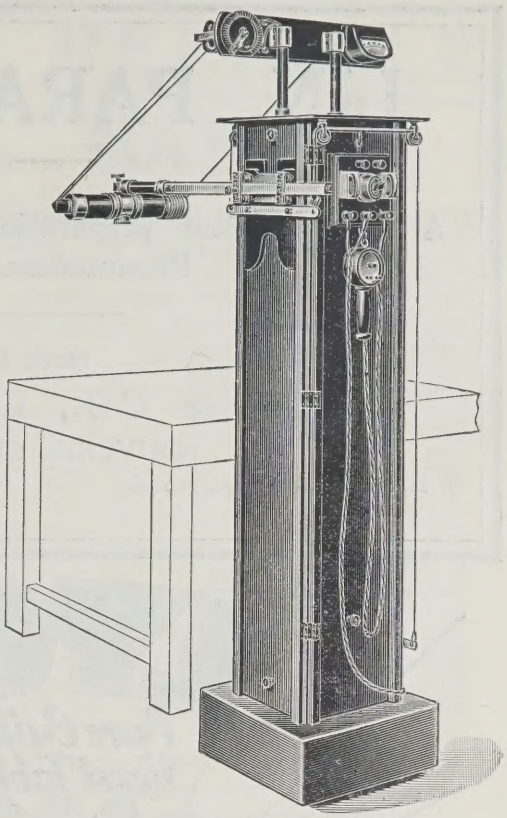

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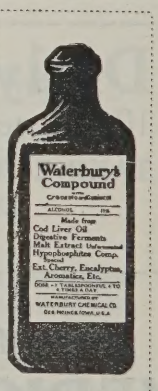

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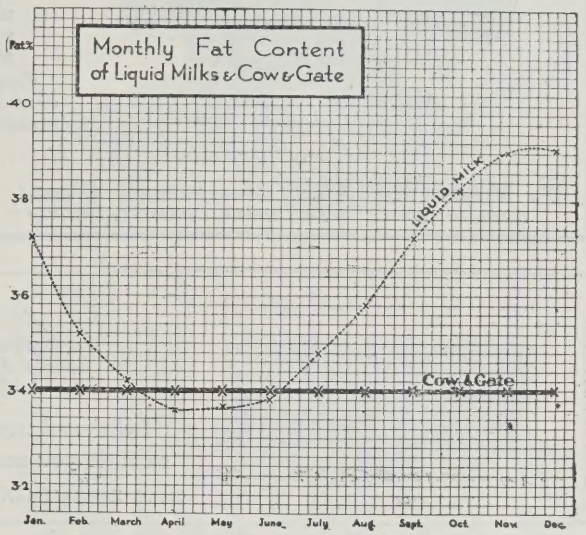

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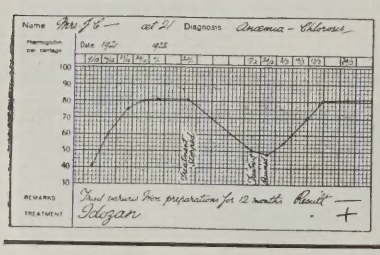

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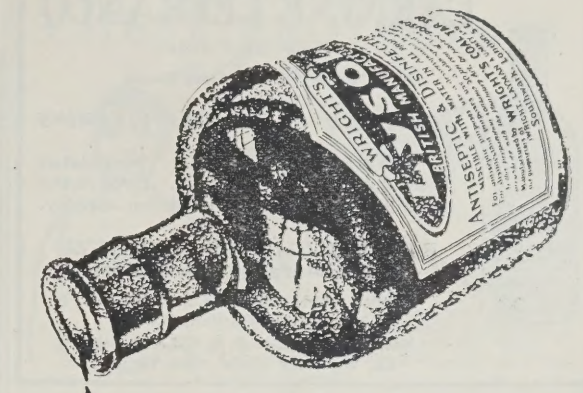

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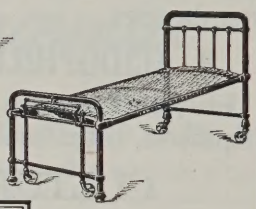

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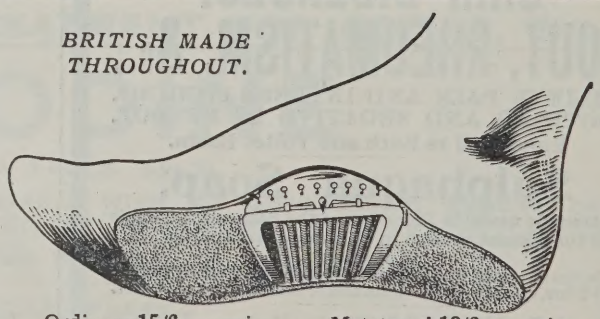

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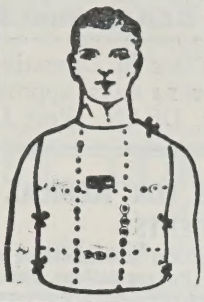

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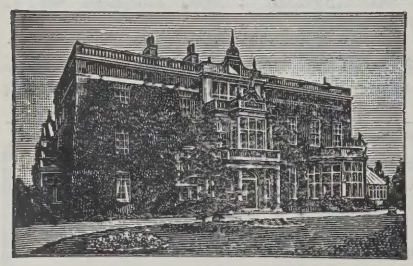

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ANDREW MORLAND, M.B. (Lond.)

Apply: Mr. D. C. FORD, Secretary,
The Sanatorium, Mundesley, Norfolk.

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FOR THE TREATMENT OF TUBERCULOSIS

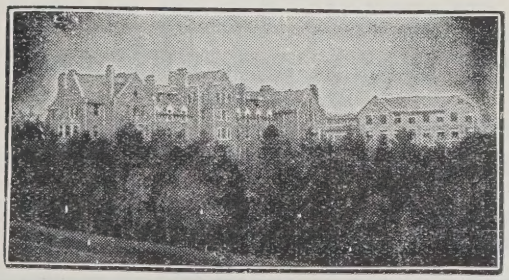
This Sanatorium is situated at SUNNINGHILL, amid the Pines. It stands 500 feet above sea level. All forms of treatment are available. X-ray Installation. Full Nursing Staff. One hour by road or rail from London.

Resident Medical Superintendent—BERKELEY N. ASH, M.R.C.S., L.R.C.P., late Physician, Pendyffryn Hall, North Wales; 1st M.O. King Edward VII. Sanatorium, Midhurst.

For full particulars apply to the SECRETARY, FARMWOOD, ASCOT.

TOR-NA-DEE SANATORIUM

MURTLE, DEESIDE, ABERDEENSHIRE.



Medical Director: DAVID LAWSON, M.D., F.R.S.E.

FULLY EQUIPPED WITH *EVERY MODERN APPLIANCE* FOR THE DIAGNOSIS AND TREATMENT OF ALL FORMS OF TUBERCULOSIS & ALLIED DISEASES.

Physician Superintendent: J. M. JOHNSTON, M.B., D.P.H., etc.

Full particulars and Prospectus on application to the Secretary.

INCLUSIVE TERMS: SEVEN GUINEAS A WEEK.

LINFORD SANATORIUM,

RINGWOOD, NEW FOREST, HANTS.

Established 1898 for the treatment of Tuberculosis. Radiators and Electric Light throughout. Hot and cold water and shower bath in nearly all rooms. Powerful X-Ray Plant. Ultra-Violet Rays. Full Nursing Staff. All forms of treatment available.

Farm of 120 acres, including 40 acres wood. Herd of Tuberculin-tested Guernsey cows kept.

Resident Physicians—ARTHUR DE W. SNOWDEN, M.D., B.Ch.(Cantab.).
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COLIN CASSIDY, M.B., B.Ch.(Cantab.).

THE BRITISH SANATORIUM

MONTANA sur/Sierre, Switzerland.

Opened on January 1st, 1929, for the treatment of Pulmonary Tuberculosis—English Nursing Staff.

Inclusive terms from **7 guineas** a week.

Medical Superintendent:
HILARY ROCHE, M.D. (Melb.), M.R.C.P. London.
Tuberculous Diseases Diploma (Wales); formerly H.P. Brompton Hospital, Medical Superintendent Palace Sanatorium, Montana.

SMEDLEY'S HYDRO,

MATLOCK. Established. 1853.

Physicians: G. C. R. Harbinson, M.B., B.Ch.
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An ideal holiday in RAVEN HOTEL
England's famous Spa. PARK HOTEL
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Brine Baths, Mixed Bathing, Golf, Tennis. Extensive grounds. 230 Rooms. Garages.

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PEEBLES HYDRO

Beautifully situated 600 feet above sea level. Facing South, completely sheltered from North and East.
21 miles from Edinburgh.
All modern Baths, Douches, Massage and Electrical Treatment, Ultra-Violet-Radiation. Physician in attendance.
IDEAL HEALTH RESORT.
Electric Light, Central Heating, Electric Lift, Three Billiard Tables, Ball Room, Winter Garden, Swimming Bath, Hard and Grass Tennis Courts, Badminton, Croquet Lawn, Golf Course.
Prospectus from Manager. 'Phone: Peebles 2.

INEBRIETY.

Telephone: 16 Rickmansworth.

DALRYMPLE HOUSE, RICKMANSWORTH, HERTS.

For the treatment of Gentlemen under the Act and privately. Established 1883 by an association of prominent medical men and others for the study of inebriety; profits, if any, are expended on the institution. Large secluded grounds on the banks of the river Colne. Full sized billiards, tennis, croquet, bowls. Golf (Moor Park and Sandy Lodge) close by.—Apply to F. S. D. HOGG, M.R.C.S., &c., Res. Med. Supt.

THE RESIDENTIAL TREATMENT OF ALCOHOLISM & DRUG ADDICTION.

RENDLESHAM HALL

(Postal Address), WOODBRIDGE, SUFFOLK

RENDLESHAM HALL, which is open to receive patients, is essentially a Sanatorium. Its daily life and routine are that of an ordinary comfortable holiday or health resort, or of a large country house. Each patient has all the privileges of a guest consistent with the prescribed medical treatment.

Rendlesham Hall has 45 Bedrooms, and about 450 acres of Gardens and Park. It has also a private Nine-hole Golf Course, Tennis and Croquet Lawns, and Bowling Green.

Illustrated Booklet, giving particulars as to terms, etc., can be had on application to THE RESIDENT MEDICAL SUPERINTENDENT.

Telegrams and Telephone:
WICKHAM MARKET 16.

RENDLESHAM HALL

To those desiring to be nearer London,

THE MANSION, BECKENHAM PARK, BECKENHAM,

as carried on for the last twenty years, is available.

Booklet and particulars from THE RESIDENT MEDICAL SUPERINTENDENT.

Telephone: RAVENSBOURNE 0648. *Telegrams:* NOROTORIUM, BECKENHAM

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ALCOHOLISM, OTHER DRUG HABITS, and TROPICAL Ailments

THE HARE NURSING HOME

As founded and established by the late Dr. FRANCIS HARE, for 20 years Med. Supt. of The Norwood Sanatorium, and author of "Alcoholism," etc.; for the treatment of ALCOHOLISM, other Drug Habits, Insomnia, Neurasthenia, Functional Nervous Disorders, TROPICAL Ailments, etc.

"OAKLANDS," 15, THE AVENUE, BECKENHAM, KENT.

Terms Moderate. Quiet and pleasant situation.
Ladies and gentlemen admitted for treatment.
For Prospectus, etc., write or phone, **WALTER E. MASTERS, M.D., M.R.C.S., D.P.H.** (Res. Med. Supt.)
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ALCOHOLISM, DRUG HABIT and NEURASTHENIA.

BAY MOUNT, PAIGNTON.

Ladies and Gentlemen treated in small Private Home
EXCELLENT RESULTS FROM MODERN TREATMENT.
WINTER SUNSHINE AMPLE AMUSEMENT.
MODERATE INCLUSIVE TERMS.
Prospectus, report, etc., from STANFORD PARK, Res. Med. Supt.
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FUNCTIONAL NERVOUS DISORDERS ALCOHOLISM and DRUG ADDICTION

at CALDECOTE HALL, NUNEATON.

This Mansion has been opened upon the most modern and scientific lines both physical and mental.
Resident Medical Superintendent—
A. E. CARVER, M.A., M.D., M.R.C.S., D.P.H., D.P.M.
Full particulars upon request.
Prospectus from the SECRETARY, 40, Marsham Street, Westminster, S.W.1

THE COPPICE, NOTTINGHAM,

HOSPITAL FOR MENTAL DISEASES.

President: The Right Hon. the EARL MANVERS.

This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted. For terms, &c., apply to the Medical Superintendent.

CHISWICK HOUSE

A PRIVATE MENTAL HOSPITAL FOR THE TREATMENT AND CARE OF MENTAL AND NERVOUS DISORDERS.
Now removed to—

CHISWICK HOUSE, PINNER, MIDDLESEX.

A modern country house 11 miles from Marble Arch, in beautiful and secluded grounds.
Fees are from 10 guineas a week.
Voluntary Patients received for treatment.
DOUGLAS MACAULAY, M.D., D.P.M.

BARNWOOD HOUSE, GLOUCESTER.

A REGISTERED HOSPITAL FOR THE CARE AND TREATMENT OF LADIES AND GENTLEMEN SUFFERING FROM NERVOUS AND MENTAL DISORDERS.

Within two miles of the G.W. Railway and L.M. & S. Railway Stations at Gloucester, the Hospital is easily accessible by rail from London and all parts of the United Kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of over 280 acres. Voluntary Boarders of Both Sexes are also received for treatment.
Special accommodation for Lady Voluntary Boarders is also provided at the MANOR HOUSE, which has its own private grounds and is entirely separate from the main Hospital.
For particulars as to terms, &c., apply to ARTHUR TOWNSEND, M.D., Resident Superintendent.
Telephone: No. 7 Barnwood.

PORTSMOUTH CITY MENTAL HOSPITAL.

Accommodation is provided for the reception of PRIVATE PATIENTS of both sexes in three detached Villas, which are healthily and pleasantly situated in extensive grounds with sea views.
Charges from 3 guineas weekly, including all necessaries except clothing.—Apply to the Medical Superintendent and Resident Physician, THOMAS BEATON, O.B.E., M.D., M.R.C.P.

THE WARNEFORD, OXFORD.

HOSPITAL FOR MENTAL DISORDERS.

President: The Right Hon. the EARL OF JERSEY.

This Registered Hospital, for the Treatment and Care, at moderate charges, of Mental Patients belonging to the educated classes, stands in a healthy and pleasant situation on Headington Hill, near Oxford. Voluntary Boarders are also received for treatment.—For further particulars apply to the Medical Superintendent.

NATIONAL ADOPTION SOCIETY,

4, Baker Street, W.1

(West of England Branch: 8, Bennett Street, Bath)

seeks Adopting Homes for Baby Boys and Girls who are medically recommended.

No payment.

Telegraphic Address: "Relief, Old Catton." Telephone: 290 Norwich.

NERVOUS & MENTAL AFFECTIONS.

Ladies only received.

The Grove, Old Catton, Norwich.—**A High-class Home for the Curative Treatment of Nervous Affections. Voluntary Boarders are also received without certificates.**

For full particulars apply to the Misses MCLINTOCK, or to Dr. S. BARTON, 34, Surrey-street, Norwich, Visiting Physician.

PRIVATE PATIENTS.

London County Council.—Accommodation for Male Paying Patients is provided at the LONDON COUNTY MENTAL HOSPITAL, Claybury, Woodford Bridge, Essex.

The hospital is thoroughly equipped for modern treatment of certified cases.

Terms, exclusive of clothing and special luxuries, for patients having a legal settlement in the County of London, 44s. 11d. a week; for others, 48s. 5d. a week.

Full particulars from the Medical Superintendent, Claybury Mental Hospital, or from the Acting Chief Officer, Mental Hospitals Department, The County Hall, S.E.1.

Preston Deanery Hall, Northampton.

3½ miles L.M.S. Station.

This Dietetic Establishment is equipped for the complete investigation and treatment of patients on rational lines. Own X ray and Laboratory. Biochemical investigation is made a special feature.
Resident Biochemist, Masseurs and Masseuses, Hydro and Electro Therapeutics, Fasting on Scientific Principles. The Staff are specially qualified to deal with the errors of Metabolism and provision is made for the treatment of Tropical Diseases.
Further particulars from the Secretary, Preston Deanery Hall, Northampton. Tel.: Hardingstone 6.

Backsettown, Henfield, Sussex.

A HOUSE primarily intended by the promoters to supply a "Rest Pause" for over-worked professional women and others with heavy domestic, social or public responsibilities. Own room. Meals in bed or in sunny garden optional. Ultra-violet radiation. Fully trained Matron. Medical supervision. (No mental, borderline or infectious cases.)
"The salient feature of the Rest Home recently opened at Backsettown, Henfield, Sussex, is the recognition of the need for solitude, quiet, and complete freedom from all responsibility if the patient is to recover poise and mental vigour with the least possible delay."—(Lancet, Oct., 1928.)
4 to 8 guineas weekly. Week-ends from 25s.
Secretary, 15, Eaton-gardens, Hove. Tel.: Hove 4555.

Grove House, All Stretton, Church STRETTON, SHROPSHIRE.

A PRIVATE HOME for the Care and Treatment of a limited number of Ladies Mentally Afflicted.
Climate healthy and bracing.
Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

Bucks Mental Hospital,
Stone, near Aylesbury.

The Visiting Committee of this Hospital can receive PRIVATE PATIENTS at a minimum weekly charge of 1½ guineas. No vacancies for female cases at present.
Apply to the Medical Superintendent.

Children's Hostel and Holiday Home
for delicate Children or those whose parents reside abroad. Every care given to health. Doctor's recommendation.—Miss Grigsby, Chalet Soldanella, Champery, Switzerland.

Devon, South Coast Resort.—
Medical Man receives INVALIDS or CONVALESCENTS. Chronic Rheumatism, Neurasthenia; slight mental not objected to. Comfortable home, secluded garden. Terms from 5 guineas. Two vacancies at present.—Address, BM/BDF4, London, W.C.1.

Physician of wide experience in Nervous
and Mental work has a VACANCY in his Private Home for a Patient. Individual and Intensive Treatment. Extensive lawns. Beautiful gardens. In-door and out-door occupations and games. Motoring. Easy distance from town. Terms moderate. Relatives interviewed in London.—Address, No. 445, THE LANCET Office, 423, Strand, W.C.2.

The Belgrave Hospital for Children
(Incorporated), 1, Clapham-road, S.W.9.

The Committee of Management invite applications for the posts of HOUSE SURGEON and ASSISTANT HOUSE PHYSICIAN which will become vacant on April 30th.

Applicants (Men) must be fully qualified and registered. The appointments are for six months, with board, residence, and washing provided.

Salary at the rate of £100 per annum in each case.

Applications, with copies of testimonials, stating age, to be forwarded on or before Thursday, April 4th.

By order.
THOS. CLAPHAM, Secretary.

Beit Memorial Fellowships for
MEDICAL RESEARCH.

Notice is hereby given that an ELECTION OF JUNIOR FELLOWS will take place in JULY, 1929. The Fellows then elected will be required to begin work on October 1st. Junior Fellowships are of the annual value of £400; the usual tenure is for three years. Applications from candidates must be received on or before 1st June, 1929.

Forms of application and all information may be obtained by letter only addressed to:—Sir JAMES K. FOWLER, Honorary Secretary, Beit Memorial Fellowships for Medical Research, 35, Clarges-street, London, W.1.

The London Female Lock Hospital,
283, Harrow-road, London, W.9.

The Board of Management invite applications for the appointment of HOUSE SURGEON (Male or Female) at the Female Lock Hospital. Salary at the rate of £150 per annum, with furnished rooms, full board, and washing. Candidates, who must be doubly qualified and duly registered, should send in their applications by 10 A.M. on or before April 8th, 1929, accompanied by copies of three recent testimonials, to the Secretary, from whom further particulars can be obtained. The appointment is for six months commencing May 10th, 1929.

The Willesden General Hospital
(Incorporated), London, N.W.10. (106 Beds.)

The Executive Committee invite applications for the appointment of RESIDENT HOUSE SURGEON (Male). Candidates must be duly registered under the Medical Acts, and unmarried.

The appointment is for a period of six months from 1st May, 1929 (the first three months as Junior House Surgeon, the second three months as Senior House Surgeon). Salary at the rate of £100 per annum.

Fully detailed applications, with copies of testimonials, to be received by the Secretary not later than noon on Thursday, 4th April, 1929.

18th March, 1929.

The Hospital for Epilepsy and
PARALYSIS, Maida Vale, W.9.

A RESIDENT MEDICAL OFFICER required 1st May.
HOUSE PHYSICIAN required 1st May.

Applications are invited for these posts. The salaries are at the rate of £150 and £100 per annum, respectively, and the appointments are for six months. Candidates for the post of Resident Medical Officer should state if they are willing to take that of House Physician, and applications, accompanied by copies of three recent testimonials, should reach me by 4th April.

The accommodation at the Hospital does not permit of Women Graduates holding these appointments.

H. W. BURLEIGH.
Secretary and General Superintendent.

The Grocers' Company.
RESEARCH SCHOLARSHIPS.

With the object of encouraging Original Research in Sanitary Science, the Grocers' Company offer Scholarships, each of £300 a year, with an allowance to meet the cost of apparatus and other expenses in connexion with the work, tenable for one year, but renewable for a second or third year, subject to the conditions of the scheme under which they are established.

The next election will take place in May, 1929.

Applications must be sent in before the end of April to the Clerk to the Grocers' Company, Grocers' Hall, London, E.C. 2, from whom a form of application and further information may be obtained.

Western Skin Hospital, 44, Hamp-
stead-road, N.W.1.—Vacancy occurs for an HONORARY ASSISTANT DERMATOLOGIST. Applications and testimonials should be sent to S. FERGUSON BUNDY, Secretary.

City of London Hospital for Diseases
OF THE HEART AND LUNGS, Victoria Park, E.2.
('Bus, Tram, and Rail, Cambridge Heath, L. & N.E.R.)

Applications for a post of HOUSE PHYSICIAN (Male), with copies of recent testimonials, are invited to be sent to the undersigned by Monday, 15th April, 1929.

The appointment will be for six months from 1st May, 1929. Salary at the rate of £100 per annum, with board, residence, and laundry provided. GEORGE WATTS, Secretary.

Hospital of St. John and St. Elizabeth,
60, Grove End-road, London, N.W.8.

Applications are invited for the post of RESIDENT HOUSE SURGEON (Male). The appointment will be for six months from May 1st, 1929. Salary at the rate of £75 per annum, with full board. Applications, together with three testimonials, should reach the undersigned not later than April 3rd, 1929.

F. DUDLEY HOBBS, B.A., Secretary.

Connaught Hospital for Walthamstow,
WANSTEAD AND LEYTON, Oxford-road, Walthamstow, E. 17.

RESIDENT HOUSE PHYSICIAN (Male) required. Salary £100 per annum.

RESIDENT HOUSE SURGEON (Male) required. Salary £100 per annum.

Each appointment to date from May 1st, and to be for a period of six months.

Applications, with three testimonials (or copies), should be sent to the Secretary to reach him not later than April 6th.

West End Hospital for Nervous
DISEASES
In-Patient Department: Gloucester-gate, Regents Park, N.W.
Out-Patients' Department and Secretary's Office: Welbeck-street, W.

The Committee of Management invites applications for the appointment of TWO HON. ANÆSTHETISTS. Further particulars should be obtained from the undersigned to whom it is requested that twelve copies of the application and testimonials may be sent not later than Monday, April 22nd.

J. P. WETENHALL, Secretary.

London Temperance Hospital,
Hampstead-road, N.W.1.

Applications are invited for the post of HOUSE PHYSICIAN which will become vacant on the 15th April, 1929.

The appointment is for a period of six months at a salary of £100 per annum. *Ceteris paribus*, preference will be given to total abstainers.

Applications, accompanied by not more than three testimonials, stating qualifications, age, &c., must be received by first post Thursday, 4th April, addressed to the undersigned.

A. C. ADAMS, Secretary.

East London Hospital for Children
AND DISPENSARY FOR WOMEN, Shadwell, E.1.

Applications are invited for the post of RESIDENT MEDICAL OFFICER (Male). The appointment is for one year and from 1st May, 1929. Applicants must be duly certified Practitioners in Medicine and Surgery. Salary at the rate of £200 per annum with board, residence, and laundry. Applications, together with testimonials, should be sent to the undersigned not later than April 13th. W. M. WILCOX, Secretary.

N.B.—The House Surgeon is applying for this Post.

Applications are also invited for the Resident Posts of (HOUSE SURGEON and Whole-time CASUALTY OFFICER SMale). The appointments are from May 1st for six months. laalary at the rate of £125 per annum, with board, residence, and shundry provided. Applications, together with testimonials, ould be sent to the undersigned not later than April 13th.

W. M. WILCOX, Secretary.

N.B.—The Candidate for the reciprocity scheme with Barnes Hospital, St. Louis, U.S.A., is selected from previous Residents at the East London Hospital for Children.

The Miller General Hospital,
Greenwich-road, S.E.10.

CASUALTY OFFICER (Male, and unmarried) required. There are four other residents. Salary £150 per annum with board, residence, and laundry. Duties to commence on or as soon after the 1st of April as possible. Applications, stating age, nationality, qualifications, and experience, accompanied by copies of not more than three recent testimonials, to be sent to the Secretary as soon as possible.
March 25th, 1929.

Bolingbroke Hospital (120 beds),
Wandsworth Common, S.W.11.

HOUSE PHYSICIAN (Male) required. The appointment is for six months, commencing on the 20th April next. Salary £120 per annum, with board, residence, and laundry.
Candidates must be fully qualified and registered.
Applications, stating age, qualifications, and experience, with copies of not more than three testimonials, should be sent to the undersigned on or before 9th April, 1929.
W. S. RANDOLPH BISS, Secretary-Superintendent.

Hospital for Consumption and Diseases
OF THE CHEST, Brompton, S.W.3.

The Committee of Management invite applications for the post of ASSISTANT RESIDENT MEDICAL OFFICER. Candidates must be Registered Practitioners, and must have held a Resident Hospital appointment for six months. Salary £150 per annum, with board and residence. The post is a Senior Resident appointment and will include the duty of Assistant to the Surgeons to the Hospital. Applications, with testimonials, must reach the undersigned not later than Saturday, 13th April.
FREDERICK WOOD, Secretary.
Brompton, March 30th, 1929.

Hospital for Consumption and Diseases
OF THE CHEST, Brompton, S.W.3.

The Committee of Management invite applications from duly qualified medical men for the post of JUNIOR HOUSE PHYSICIAN at the Sanatorium at Frimley. The appointment is for six months dating from 1st June, 1929. In the event of a vacancy the Junior House Physician at the expiration of his term of office will be expected to apply for and, if appointed, to hold the post of Senior House Physician. The honorarium is at the rate of £100 per annum, with full board and lodging. Applications, with copies of testimonials, must reach the undersigned not later than Wednesday, 17th April, 1929.
FREDERICK WOOD, Secretary.
Brompton, March 30th, 1929.

Royal Chest Hospital, City-road, E.C.1.
(Royal Northern Group of Hospitals.)

Applications are invited for the following posts:—
RESIDENT MEDICAL OFFICER. Vacant on 1st May. The appointment is for six months, when re-election is required. Salary at the rate of £150 per annum with board, residence, and laundry.
HOUSE PHYSICIAN. Vacant 1st May. The appointment is for six months; salary at the rate of £100 per annum with board, residence, and laundry.
Applications, with copies of testimonials, should be sent on or before the 10th April to the undersigned, from whom forms of application, rules and further particulars can be obtained.
GILBERT G. PANTER, Secretary.
Royal North ern Hospital, London, N.7.

The Prince of Wales's General
HOSPITAL, Tottenham, N.15.

The following Resident posts will be vacant on the 1st May next:—
SENIOR HOUSE PHYSICIAN, SENIOR HOUSE SURGEON and SPECIAL HOUSE SURGEON. Salaries at the rate of £120 per annum.
JUNIOR HOUSE PHYSICIAN and Two JUNIOR HOUSE SURGEONS. Salaries at the rate of £90 per annum.
Board, residence, and laundry.
Appointment held for six months, but holders are eligible for re-appointment for a further term.
Candidates (male) must be fully qualified and registered, and applications, (on prescribed form), together with copies of three recent testimonials, should be sent to me on or before the first post on Monday, 15th April. FREDK. W. DREWETT, Director.
March 25th, 1929.

Hull Royal Infirmary.

Applications are invited for the post of HOUSE PHYSICIAN (Male), vacant April 19th.
Applicants must be fully qualified. Period of appointment, six months in the first instance; salary at the rate of £200 per annum, with board and residence.
Applications, together with copies of testimonials, should reach the undersigned on or before Tuesday, April 9th.
22nd March, 1929. R. J. CARLESS, House Governor.

Worcester General Infirmary.—
JUNIOR RESIDENT MEDICAL OFFICER wanted. Applications from gentlemen are invited, stating age, qualifications, experience, and whether married or single, with copies of recent testimonials (not more than four), not later than 5th April. Salary £120 per annum, inclusive, with board, residence, and washing.
E. J. HOLLAND, Secretary.

Norfolk & Norwich Hospital, Norwich.

Applications are invited for the post of HOUSE PHYSICIAN. Salary £120 per annum, with board, residence, and laundry. Preference will be given to a candidate who has held a previous Hospital appointment. Candidates (Male) who must possess registered qualifications, should forward applications stating age, nationality, &c., together with copies of testimonials, to the undersigned, not later than Tuesday, 16th April, 1929.
FRANK INCH, House Governor and Secretary.
March 30th, 1929.

Manchester Victoria Memorial Jewish
HOSPITAL, Manchester. (Non-sectarian.)

Applications are invited for the post of SENIOR HOUSE SURGEON (Male). The appointment is for one year, the holder being eligible for re-election for a further period of one year. Salary at the rate of £250 per annum, with board, residence, and laundry. The successful applicant must be prepared to commence duties on May 1st, 1929. Applications, stating age, qualifications, and experience, with copies of testimonials, to be forwarded to the undersigned not later than April 5th, 1929.
FRANK JENNINGS, Superintendent.

The Sheffield Royal Hospital.
(340 Beds.)

There is an immediate vacancy for a RESIDENT ANÆSTHETIST (Male). The appointment will be for six months and the selected candidate will be eligible for re-appointment or appointment to another office on the Resident Staff. Salary £80 per annum, with board, residence, and laundry. Applications, with copies of testimonials, should be sent as soon as possible to the undersigned.
W. H. BOOTH,
7th January, 1929. Superintendent and Secretary.

Northampton Education Committee.
ASSISTANT SCHOOL DENTIST.

Applications are invited for the appointment of a fully qualified Dental Surgeon (man or woman) as Assistant School Dentist. Salary £450 per annum.
Further particulars and forms of application may be obtained from the undersigned by whom applications should be received by not later than 12th April, 1929.
A. C. BOYDE, Director of Education, Education Office, 4, St. Giles'-street, Northampton.

The Royal Hospital, Wolverhampton.
(Incorporated under Charter.)

A RESIDENT MEDICAL OFFICER wanted.
The Hospital contains 240 beds, the usual Special Departments, and is recognised by the various Examining Bodies for a part of the requisite attendance on Medical and Surgical Practice.
Candidates must be registered under the Medical Acts. The appointment is for six months, with a salary at the rate of £150 per annum, board, furnished rooms, and laundry provided. Duties to commence forthwith.
Applications, with copies of testimonials, to the undersigned.
W. H. HARPER, House Governor and Secretary.
Wolverhampton, 16th March, 1929.

Administrative County of East Suffolk.
APPOINTMENT OF WOMAN ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH.

Applications are invited from registered women medical practitioners for the above appointment.
The duties of the post include the Medical Inspection of School Children, Maternity and Child Welfare work, and Clinical and Tuberculosis work; experience in refraction is essential and the possession of the Diploma in Public Health will be a recommendation. The person appointed will be required to devote the whole of her time to the duties of the office.
The salary attaching to the post will be £600 per annum. A deduction of 5 per cent. for superannuation will be made, and motor car allowance will be paid on the Council's scale for use of the Officer's car.
The person appointed will be required to pass a medical examination and the appointment will be subject to three months' notice on either side.
Applications are to be made upon a form which can be obtained from the County Medical Officer of Health, County Hall, Ipswich, to whom the completed forms should be returned not later than Monday, 15th April.
CECIL OAKES, Clerk of the County Council.
County Hall, Ipswich, 25th March, 1929.

Hull Royal Infirmary.—Applications

are invited for the post of THIRD HOUSE SURGEON (Male), vacant April 13th.

Applicants must be fully qualified. Period of appointment, six months in the first instance; salary at the rate of £150 per annum, with board and residence.

Applications, together with copies of testimonials, should reach the undersigned on or before Tuesday, April 2nd.

15th April, 1929. R. J. CARLESS, House Governor.

Altrincham General Hospital, Cheshire.

HOUSE SURGEON required. Candidates must be fully qualified and registered. Salary £105 per annum, with board, residence, and laundry.

The appointment is for six months, subject to re-appointment for a further period of six months if satisfactory.

Applications, stating age, and experience, together with copies of recent testimonials, to be sent in not later than April 10th to WILLIAM MOODY, Secretary, 31, Market-street, Altrincham, Cheshire.

Addenbrooke's Hospital, Cambridge.

Applications are invited for the post of HOUSE SURGEON to the Special Departments. The appointment will be for six months from April 6th, 1929, but is terminable at an earlier date by one month's written notice on either side. Salary at the rate of £130 per annum, with board, residence, and laundry. Candidates (Male), who must be unmarried and duly registered, are requested to forward their applications, stating age, qualifications, &c., together with copies of not more than four testimonials, to the undersigned as soon as possible.

W. H. HEAD, Secretary-Superintendent.

Administrative County of Southampton

COUNTY MEDICAL OFFICER OF HEALTH.

The Hampshire County Council invite applications for appointment of County Medical Officer of Health from persons legally qualified for the practice of medicine, surgery, and midwifery and registered in the Medical Registrar as holders of a Diploma in Sanitary Science, Public Health, or State Medicine, under Section 22 of the Medical Act, 1886, and of an age not exceeding forty-five years at the date of application. The post is established for the purposes of Superannuation.

The person appointed will be required to devote the whole of his time to the duties of his office and not to hold any other appointment or engage in private practice.

He will receive a salary of £1250, payable monthly and all sums by way of fees or otherwise received by him will be paid over to the County Fund.

He will be provided with the necessary offices and clerical staff.

Applications on a prescribed form (which with further particulars of duties and conditions of appointment may be obtained from me) addressed to me and endorsed "County Medical Officer" must be delivered at the Castle of Winchester on or before the 20th April, 1929.

Canvassing, either directly or indirectly, is prohibited and will disqualify. F. V. BARBER, Clerk of the County Council.

The Castle, Winchester, March, 1929.

County Council of Durham.

DISTRICT TUBERCULOSIS MEDICAL OFFICER.

The County Health Committee invite applications for a District Tuberculosis Medical Officer, at a commencing salary of £600 per annum, rising by annual increments of £25 to £650 per annum. Travelling expenses will be paid by the County Council.

The appointment will be held subject to three months' notice on either side, and to the following conditions:—

(1) The officer appointed must be a registered Medical Practitioner between the ages of twenty-five and forty-five years, must devote the whole of his time to the duties of the office, and must not engage in private practice.

(2) He should have held a house appointment for at least six months in a general hospital and have had practical experience in the treatment of tuberculosis in sanatoria and otherwise.

(3) He will be attached to the County Health Department, and will, subject to the directions of the County Medical Officer, be under the control of the Central Tuberculosis Medical Officer

(4) He will be required to reside in his Dispensary area, or such other centre as required by the Council.

(5) He will be required to carry out the duties of a District Tuberculosis Medical Officer.

(6) He must be prepared, if called upon, to act as locum tenens to other members of the Medical Staff of the County Medical Officer.

(7) The holding of a Diploma in Public Health, and practical experience in bacteriological laboratory work, will be deemed additional qualifications for the post.

The candidate appointed will be required to pass the County Council's medical examination, and will be subject to the provisions of the Local Government and Other Officers' Superannuation Act, 1922.

Applications endorsed "District Tuberculosis Medical Officer," with copies of not more than three recent testimonials, must be forwarded on or before 5th April next to the County Medical Officer, Shire Hall, Durham, from whom forms of application can be obtained.

HAROLD JEVONS, Clerk of the County Council.

Shire Hall, Durham, 18th March, 1929.

Norfolk & Norwich Hospital, Norwich.

Applications are invited for the posts of:—

HOUSE SURGEON. Salary £120 per annum, with board, residence, and laundry. Preference will be given to a candidate who has held a previous Hospital appointment.

HOUSE SURGEON TO THE SPECIAL DEPARTMENTS (Ear, Nose and Throat and Ophthalmic). Salary £120 per annum, with board, residence, and laundry. Candidates (Male) who must possess registered qualifications, should forward applications, stating age, nationality, &c., together with copies of testimonials, to the undersigned, not later than Tuesday, 8th April, 1929. FRANK INCH,

22nd March, 1929 House Governor and Secretary.

City and County of Newcastle-upon-Tyne.

CITY HOSPITAL FOR INFECTIOUS DISEASES.
RESIDENT MEDICAL ASSISTANT (MALE).

Wanted immediately, a Resident Medical Assistant (Male) who holds a registrable qualification in Medicine and Surgery (and preferably also in Public Health), and possesses a practical knowledge of Bacteriology.

Salary £350 per annum, with board, lodgings, &c.

Applications, stating age, qualifications, and previous experience, to be forwarded with copies of not more than three recent testimonials to the Medical Officer of Health, Town Hall, Newcastle-upon-Tyne.

19th March, 1929.

Borough of Bexhill.

MEDICAL OFFICER OF HEALTH.

Applications are invited from duly qualified gentlemen for the appointment of Medical Officer of Health of the Borough, subject to the provisions of the Public Health Officers' Act, 1921, and the Sanitary Officers' Order, 1926.

The gentleman appointed will be required to perform all the duties imposed on a Medical Officer of Health, to act as School Medical Officer, and to carry out all such duties as the Council with the consent (if necessary) of the Minister of Health, may from time to time direct. He must reside in the Borough and devote his time to the duties of the office and must not engage in private practice.

The salary to cover all the duties specified above will be £800 per annum inclusive.

Applications stating age, experience, &c., accompanied by copies of not more than three recent testimonials, should reach the undersigned not later than the 6th April, 1929, endorsed "Medical Officer." S. J. TAYLOR, Town Clerk.

Town Clerk's Office, Bexhill, 19th March, 1929.

Hull Royal Infirmary.

The Appointing Committee invite applications for the office of HONORARY PHYSICIAN to the Institution.

Applicants must have obtained a Degree in Medicine at one of the Universities of the United Kingdom, be a Fellow or Member of the Royal College of Physicians of London, Edinburgh, or Ireland, and be duly registered under the Medical Acts.

Honorary Physicians are appointed for a period not exceeding twenty years, or until attaining sixty years of age, and in accordance with the terms of the Royal Charter. They may not hold any paid appointment to any other Charitable Medical Institution or to a Poor-law Institution.

Applicants are prohibited from personally canvassing, but may send copies of their applications and testimonials to the members of the Appointing Committee.

Applications addressed, "The Chairman, Committee of Management," must be received at the Institution not later than 10 A.M. on Wednesday, the 3rd April, 1929.

March 18th, 1929. R. J. CARLESS, House Governor.

Liverpool Port Sanitary Authority.

ASSISTANT PORT MEDICAL OFFICER.

The Corporation of the City of Liverpool, as Port Sanitary Authority, require the services of an Assistant to the Medical Officer of Health, whose duties will be in connection with the Tidal Inspection of Vessels, the Medical Inspection of Aliens, and such other duties as may from time to time be assigned to him.

The salary will commence at £700 per annum, increasing to £800 per annum by annual increments of £50.

Candidates must possess a registrable Medical and Surgical qualification, and should hold a Diploma in Public Health, and their age must not exceed thirty-five years.

The person appointed will require to devote whole-time service to the duties specified, and will be subject to the Superannuation provisions of the Liverpool Corporation Act, 1921.

Canvassing of members of the Council is strictly prohibited.

Applications, stating age, qualifications, and past experience, accompanied by copies of recent testimonials, should be addressed to the Chairman of the Port Sanitary and Hospitals Committee, under cover to the undersigned, and delivered not later than 5th April, 1929.

Envelopes to be endorsed "Assistant Port Medical Officer."

WALTER MOON, Town Clerk.

Municipal Buildings, Liverpool, 16th March, 1929.

Liverpool Heart Hospital.

Applications are invited for the position of HONORARY ASSISTANT PHYSICIAN to the above Hospital. Applications should reach the Secretary, Miss Lewis, 14, Cook-street, Liverpool, before 30th April.

Royal Halifax Infirmary.

Wanted, a THIRD HOUSE SURGEON (Male, unmarried). Candidates must be doubly qualified and registered. (The Resident Medical Staff consists of Resident Surgical Officer and three House Surgeons.) The appointment is for six months ending 31st October, 1929. Probable promotion if satisfactory. Salary £100 per annum, with residence, board, and laundry. Particulars of duties may be obtained from the undersigned, to whom application, with copies of testimonials, should be sent not later than 10th April.

25th March, 1929. A. MIDGLEY, Secretary.

Cassel Hospital for Functional

NERVOUS DISORDERS, Swaylands, Penshurst, Kent.

RESIDENT MEDICAL OFFICER (Male).

Applications are invited for the post of Resident Medical Officer. Candidates must be fully qualified, unmarried, and preference will be given to a man who has had experience in the treatment of Nervous Disorders. Salary £350, rising, with board, lodging, and laundry. The successful candidate will be expected to commence duty as soon as possible.

Applications should be sent to the MEDICAL DIRECTOR, Cassel Hospital, Swaylands, Penshurst, Kent.

Lincoln County Hospital.

Wanted for 1st May, a JUNIOR HOUSE SURGEON, Male, unmarried. Salary at the rate of £150 per annum, rising to £200 per annum at the conclusion of six months' approved service. Board, residence, and washing will also be provided.

Every candidate for the appointment must be registered under the Medical Acts.

Applications, stating age and other particulars, with copies of testimonials (not more than three), are to be sent to the undersigned, from whom further particulars may be obtained.

ARTHUR MOORE, Secretary-Superintendent.

Lincoln, 8th March, 1929.

United Services Fund.

HEATHERWOOD HOSPITAL, Ascot.

RESIDENT ASSISTANT MEDICAL OFFICER.

Applications are invited from fully qualified Medical Practitioners (Bachelor, not over thirty) for the above post.

Candidates must have held some appointment in a General Hospital.

The present Hospital accommodation is 136 beds for the treatment of surgical tuberculosis and other forms of crippledom.

The appointment will be for a period of twelve months and may be extended at the end of that time.

Remuneration is at the rate of £300 per annum, together with residence, board, and laundry.

The Officer appointed will be required to devote the whole of his time to the duties of the office, to give anæsthetics, etc., and generally to act under the supervision and direction of the Medical Superintendent.

Applications, stating (1) age, (2) qualifications, (3) experience, and appointments held, accompanied by three copies of recent testimonials, should be forwarded to the Secretary, Heatherwood Committee, United Services Fund, 29, Cromwell-road, South Kensington, London, S.W.7., before April 12th, 1929.

Further particulars can be supplied on application to the Medical Superintendent, Heatherwood Hospital, Ascot, Berks.

County Borough of Bournemouth.

ASSISTANT MEDICAL OFFICER (Woman).

Applications are invited for the above appointment at a salary of £600 per annum subject to deductions under the Council's Superannuation Scheme.

Candidates must be registered medical practitioners and possess a diploma of Public Health, and under the age of forty.

The officer will be expected to :—

(*a*) Conduct Child Welfare, Ante-Natal and Post-Natal Clinics ;
(*b*) act as Inspector of Midwives ;
(*c*) supervise Nursing Homes ;
(*d*) inspect and treat children in Secondary and Elementary Schools (experience in refraction will be considered an additional qualification) ;
(*e*) perform such other duties as may be directed by the Council.

The successful candidate will be required to act under the supervision and control of the Medical Officer of Health.

Applications (with photograph if desired), stating age, qualifications, and previous experience, accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 20th April, 1929.

Application forms will not be provided, but further information as to the duties, if required, may be obtained from the Medical Officer of Health. HERBERT ASHLING, Town Clerk.

Town Hall, Bournemouth. 23rd March, 1929.

Bedford County Hospital. — House

SURGEON (Male), fully qualified, unmarried, required for a term of not less than six months, commencing May 1st, 1929. Salary, £175 with board, lodging, and laundry.

Applications, stating age, nationality, qualifications, together with three recent testimonials, to be sent to the Secretary, Medical Staff Committee, not later than the first post Wednesday, 3rd April, 1929.

Royal Victoria Hospital, Folkestone.

The Committee of Management invite application for the post of JUNIOR RESIDENT MEDICAL OFFICER (Female), to commence duty 1st May, 1929. Salary attached to the post is £100 per annum with board and residence. The appointment is for six months, subject to one month's notice on either side. Applications, together with copies of recent testimonials, should be sent to the Secretary-Superintendent, Royal Victoria Hospital, Folkestone, Kent, not later than Friday, the 12th April, 1929.

Carnarvonshire and Anglesey Infir-

MARY, Bangor (a General Hospital).—HOUSE SURGEON (Male) wanted. Must be fully qualified. Salary £200 per annum with residence, board, and laundry.

Special consideration given to candidates experienced in X ray work and administering anæsthetics. Duties to commence 1st May. Applications with two recent testimonials to reach the Secretary not later than April 4th.

Wanted for the Lady Hardinge

MEDICAL COLLEGE, New Delhi, India, from mid-September, 1929, a Medical Woman with experience in teaching Anatomy, to act for the Professor of that subject during her year's leave. Salary Rs. 750 a month with free furnished house, and free passage to and from India (the rupee is standardised at 1s. 6d.).—Apply, with testimonials, to the College Principal.

The Secretary of State for India

proposes shortly to make a certain number of APPOINTMENTS to Permanent Commissions in His Majesty's INDIAN MEDICAL SERVICE. A Selection Committee will meet at the India Office on 15th April to consider applications. Well-qualified Medical Men of European descent (British subjects), who desire to be considered, should apply to the Under Secretary of State for India, Military Department, India Office, London, S.W.1, for forms of application, regulations, and other particulars. Envelopes should be marked on top left corner "Medical Recruitment." The selected candidates will be required to undergo a course of instruction in this country, commencing on 29th April next, prior to embarking for India towards the end of the year.

Goculdas Tejpal Hospital, Bombay.

APPOINTMENT OF HONORARY SURGEON.

Applications are invited for the above appointment. Goculdas Tejpal Hospital (266 beds) is associated with the Grant Medical College, Bombay, for clinical teaching of undergraduates. The appointment carries an honorarium of R150 per mensem and will be for a period of five years, subject to termination by three months' notice on either side.

Applications, in duplicate, marked "Honorary Surgeon," stating age, qualifications, and experience, together with copies of three recent testimonials, must be sent so as to reach the undersigned not later than the 15th of May, 1929.

F. N. MOOS, M.D. (Lond.),
Superintendent, G. T. Hospital, Bombay.

Hong Kong.

A vacancy at present exists for an ASSISTANT MEDICAL OFFICER OF HEALTH, Hong Kong.

Salary £740 per anum, rising by annual increments of £30 to £1040 per annum, subject to deduction of 4 per cent. of salary towards the pensions of widows and orphans of Government servants.

The engagement is for three years in first instance. Free passages are provided. Furnished quarters, if available, are provided at a rental of 7 per cent. of the salary, or an allowance is given in lieu.

Private practice is not allowed.

Candidates, who must be British subjects of European parentage and not over thirty-five years of age, must hold a Diploma in Public Health. Forms of application may be obtained on application, in writing, to the Private Secretary (Appointments), Colonial Office, 2, Richmond-terrace, Whitehall, London, S.W.1.

Wanted.—Medical Officer for group

of Tea Estates in Assam. Candidates preferably about 30 or upwards, whose experience and qualifications must bear strictest expert investigation. Four years' agreement. Commencing salary Rs.1500 a month, rising Rs.50 a month each year, plus Rs.150 a month Car Allowance throughout (Rupee equivalent 1s. 6d.). Free furnished Bungalow, use of certain servants, first class passage. Write with fullest particulars to Z.M. 751, c/o Deacon's Advertising Agency, Fenchurch-avenue, E.C. 3.

Royal Isle of Wight County Hospital, Ryde.

A vacancy having occurred in the office of HONORARY SURGEON to the Ear, Nose, and Throat Department, the Election Committee of the Governors will proceed to fill the appointment. Candidates must not be engaged in general practice. Further details may be obtained from the Secretary, to whom applications must be addressed, and should be received not later than Wednesday, April 10th. Canvassing members of the Election Committee will be a disqualification.

A. S. GORDON, Secretary.

East Riding County Council.

ASSISTANT TUBERCULOSIS OFFICER.

Applications are invited for the post of Assistant Tuberculosis Officer under the East Riding County Council.

The gentleman appointed will be required to live at the Raywell Sanatorium (64 beds), where he will be Medical Superintendent. He will also be expected to carry out the duties of Clinical Tuberculosis Officer within the County.

The salary is at the rate of £650 per annum with emoluments valued for superannuation purposes at £100 per annum, subject to the statutory deductions under the Local Government and Other Officers' Superannuation Act, 1922. The emoluments are a bungalow, rent and rates free, also fuel, light, laundry, and garden produce.

Applications, accompanied by not more than three recent testimonials, must be made on prescribed forms, which can be obtained on application and must reach the undersigned not later than Saturday, the 13th April, 1929.

(Signed) J. R. PROCTER, Clerk of the Council.

County Hall, Beverley. March, 1929.

Tynemouth Union.

ASSISTANT MEDICAL OFFICER (Non-Resident).

The Guardians of the Tynemouth Union invite applications for the appointment, for a period of six months, of an Assistant Medical Officer for their Poor-law Institution, Preston-road, North Shields, and for the Children's Homes of the Union.

Salary £300 per annum, inclusive of vaccination and all other fees. The officer appointed will be required to pay to the Common Fund of the Union all fees received by him for inquests, certifying lunatics &c., to devote the whole of his time to the duties of the office (which includes the training of Probationer Nurses), to reside in close proximity to the institution and to act under the direction of the Medical Officer.

Applicants must be duly registered under the Medical Acts, and be qualified by law to practise in Medicine and Surgery in England and Wales, and the candidate appointed will be required to produce his licenses, diplomas, or certificates to the Guardians.

The appointment is subject to the provision of the Poor-law Officers' Superannuation Act, 1896.

Applications must be made on a printed form which will be sent on receipt of a stamped, addressed foolscap envelope, and must be returned to me, accompanied by copies of testimonials as to professional ability and personal character, by the first post on Saturday, the 6th proximo. By order.

TOM PERCIVAL, Clerk to the Guardians.

Guardians' Hall, North Shields. 25th March, 1929.

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Telegrams: "REASIDE, TUBERCLE, WESTRAND, LONDON"

Pathologist, Cavendish-Sq. district,

requires PARTNER for developments.—Address No. 512, THE LANCET Office, 423, Strand, W.C. 2.

Wanted to purchase in London, W.3

or W.5, a medical PRACTICE. Necessary capital available. No agents.—Address, No. 515, THE LANCET Office, 423, Strand, W.C.2.

Wanted within 20 miles of London

by M.B. Camb., Good-class PRACTICE, with panel; good house accommodation; family of seven—to produce income £1500 to £2000.—Address, No. 513, THE LANCET Office, 423, Strand, W.C.2.

To Purchasers.—Do not Buy without

expert assistance. With forty years' experience, Mr. PERCIVAL TURNER can advise in all cases. Terms free on application to 4, Adam-street, Strand, W.C.2. Telephone: Gerrard 0399. Telegrams: "Epsomian, London."

Death Vacancy in small town. General

and Consultant with scope for a Surgeon. Good middle class. House to rent £50. Small Panel. Income about £1200.—Address, No. 514, THE LANCET Office, 423, Strand, W.C.2.

South Coast.—Old-established Practice.

Receipts nearly £1300 per annum. Good panel. Good Manor House, rent £80. Premium quite moderate, half by instalments. Apply, Peacock & Hadley, Ltd., 19, Craven-street, Strand, W.C.2.

PRACTICE FOR SALE.

Good-class Country Practice within

20 miles of Manchester. Receipts £1400, increasing yearly. Good House to Let (Rent £60) containing 5 bedrooms, 2 entertaining-rooms, surgery and waiting-room, Garage. Premium £2000.—Apply, Stowell and Bayley, Chartered Accountants, 46, Pall Mall, Manchester.

London, W.—Mixed-class Practice

for immediate disposal. Receipts last year nearly £450; panel nearly 200, increasing. House available. Premium £550. Excellent scope. Apply, Peacock & Hadley, Ltd., 19, Craven-street, Strand, W.C.2.

For Disposal.—A good Practice is not

always to be had directly, but Mr. PERCIVAL TURNER can generally offer applicants something suitable. Nearly all the best practices are sold by him without being advertised.—Full information free on application to 4, Adam-street, W.C.2

Sale.—Well-established, increasing

PRACTICE in West London, within four miles of Hyde Park Corner. Panel of 750. Income about £900. Roomy house with separate surgery and garage on long lease at £90 per annum. Premium two years' purchase.—Address, No. 509, THE LANCET Office, 423, Strand, W.C.2.

Death Vacancy. — Country Town

within one hour of London. £850 per annum. Panel and appointments £300 per annum. Most desirable RESIDENCE for Sale freehold or on lease. Good educational facilities. Prompt sale essential.—Apply, No. 8444, c/o Percival Turner, Ltd. 4, Adam-street, Adelphi, London, W.C.2.

Birchington-on-Sea. — For Sale,

owner abroad; excellent opportunity to acquire HOUSE, Minnis Bay, near sea; only £2250 or near offer. Suitable for Convalescent or Nursing Home. Owner might take payment by instalments. 2 large recep., 7 bed., roof terrace. Full particulars, communicate BM/BAL.6., W.C.

For Sale.—Leasehold Premises, good

suburb, sixty-odd years to run. Practice carried on by vendor over thirty years. House suitable for family or resident patients. Reason for relinquishing, failing health and family bereavement.—Address No. 511, THE LANCET Office, 423, Strand, W.C. 2.

Manchester (Levenshulme, Kingsway).

Ideal situation. Doctor or Dentist. 100 ft. new road. Large and growing population. 2 entertaining, 5 bedrooms, bathroom. Box., kit., scull., cellars. Inside and outside sanitation. Electric light. Plugs in six rooms. Brick garage. 2 cars. VACANT POSSESSION. Reasonable offer considered. Apply, Jas. Gordon, F.A.I., 1, New Brown-street, Manchester. City 2833.

UNOPPOSED POSITION FOR A DOCTOR.

Margate. — Situate on main road,

3 minutes from station, 1 minute from sea, with view, in the midst of a thickly populated residential district. Well-placed corner double-fronted Residence, large, light, airy rooms, spacious hall, 3 reception, conservatory, 7 bedrooms (one a fitted billiard room), vinery, tennis, lawn, grounds ½ acre. TO BE LET on LEASE.—Sole Agents, Weatherall and Green, 22, Chancery-lane, London, W.C. 2.

BRONDESBURY. BEST POSITION.

Imposing Corner Residence with

carriage drive, 3 entrances, 3 lofty fine reception rooms, 9–10 bedrooms, 2 bathrooms. Double garage. Good condition. Nice garden. Over 60 years lease, low ground rent. Bargain £2700 for quick sale.—Particulars from H. C., c/o H. M. Meyler and Co., Solicitors, 8, Churton-street, Westminster, S.W. 1.

To Let, Furnished accommodation in

double-fronted detached house; suitable doctor to start practice. Growing neighbourhood.—Woolston, Southampton. Apply Mrs. Spawton, 75, Obelisk-road.

To Let, well-furnished Consulting ROOM and WAITING ROOM, with attendance; two afternoons a week; close to Cavendish-square.—Address, No. 504, THE LANCET Office, 423, Strand, W.C.2.

Consulting Rooms to Let, Harley-street and district, whole or part time. Lists sent on application.—Elgood & Co., 10, Henrietta-street, Cavendish-square, W.1. Tel.: Mayfair 5659.

H. Ley-Clark & Partners, 3A, Wimpole-street, W.1.
CONSULTING ROOMS and HOUSES in HARLEY-street, Wimpole-street, and Medical area generally.
Lists on application. Tel.: Langham 1095.

Received too late for Classification.

Saint Mark's Hospital for Cancer, FISTULA AND OTHER DISEASES OF THE RECTUM, City-road, London, E.C.1.

HOUSE SURGEON (Male) required. Must be fully qualified. Salary £75 per annum, with board, residence, and laundry. The appointment is for a minimum of six months from the 1st of May next. Applications, with copies of testimonials, must reach the Secretary (from whom further particulars may be obtained) not later than Saturday 20th of April, 1929.

Bootle Borough Hospital.

APPOINTMENT OF HONORARY DERMATOLOGIST.

Applications are invited for the above vacancy. Candidates are requested to send particulars of their qualifications and experience accompanied by testimonials, addressed to the Secretary-Superintendent, Bootle Borough Hospital, Derby-road, near Liverpool, not later than Friday, 12th April, 1929.

Gloucester County Mental Hospital.—Required, JUNIOR ASSISTANT MEDICAL OFFICER (Male). Candidates must be registered medical practitioners and unmarried. Salary £350 per annum, with board, apartments, laundry, and attendance. The appointment is subject to the provisions of the Asylums Officers' Superannuation Act, 1909. Apply with copies of three recent testimonials, to the Medical Superintendent.

BLUNDELL & CO.
22, CRAVEN STREET, STRAND, LONDON, W.C.2.
Telephone . Gerrard 7148.

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FINE COUNTRY TOWN IN SOUTH WEST.—Good-class PRACTICE of about £1500 at good fees. Few Midwifery. House in excellent position. Premium 1½ years' purchase.
LOCK-UP SURGERY IN NORTH LONDON.—Receipts £700, increasing. Panel 500. Long lease, low rent.
BOURNEMOUTH.—Excellent house, including Nucleus of Practice. Price £2300.
LINCS.—Unopposed Country PRACTICE near good town. Receipts about £1100. Panel and appointments £400. Good modern house with large garden and separate Surgery. Garage, &c. Can be bought on easy terms. Premium 1½ years' purchase.
NORTH LONDON.—Middle- and working-class PRACTICE of £950. Formerly more but let down by illness. Small panel. No Midwifery. Roomy leasehold house. Price of house and Practice only £1300.
SOUTH LONDON.—PRACTICE of about £1000. Panel 750. Convenient house at low rent.
LADY ASSISTANT required for fine Town and Country Practice, 80 miles from London.
KENT SUBURB.—Increasing middle- and working-class PRACTICE of £1250, with 540 panel. Good house, with garden and separate entrance to surgery, on lease; rent £90. Vendor going abroad.
LEICESTERSHIRE. — PARTNERSHIP with Succession. Receipts about £1200. Large growing village near good town. Premium 1½ years' purchase for half share.
NORTHERN COUNTY.—Old-established PRACTICE of £1900. Panel 1000. Appointments £672. Opposition slight and scope for younger man. Vendor retiring. Two good towns near. House can be rented. Premium 1½ years' purchase.
PARTNERSHIP.—Nice residential district within 15 miles. Third share and half soon of about £2000. Good prospects as the place is growing. Cottage hospital, &c. Premium 2 years' purchase.

(Purchasers stating their requirements can have particulars of other practices not advertised.)

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KENT.—(Near London).—Old-established middle-class G.P. Detached house with garden and garage. Average receipts £1200. Panel approximately 1200. Premium 2 year's purchase or reasonable offer.
DORSET.—Excellent NUCLEUS with splendid scope in the near future. Receipts approximately at the rate of £200 p.a. Good house with large well-developed garden. Premium £1400 inclusive. Suitable for semi-retired practitioner.
LONDON, N.—Non-panel and non-dispensing PRACTICE. Large house. Receipts approximately £1400. Scope for panel. Premium 1½ years' purchase.
BEDFORDSHIRE.—PARTNERSHIP with possible view to Succession in old-established G.P. Receipts £1300. Panel 1759. Accommodation available. Premium for half share 2 years' purchase. Suitable to experienced man of thirty or over.
MIDDLESEX.—Outskirts of London. Well-established, growing PRACTICE in rapidly developing residential district, with scope for increase. Medium-sized house. Receipts £750. Panel 250. Fees 3s. 6d. up. Premium 1½ years' purchase.
SOUTH COAST.—PARTNERSHIP in rapidly-growing Seaside Resort. Receipts over £1200. Suitable to young, energetic man aged about 30. Premium for two-fifths share 2 years' purchase. Excellent scope for all-round increase.

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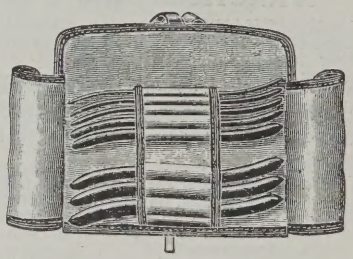

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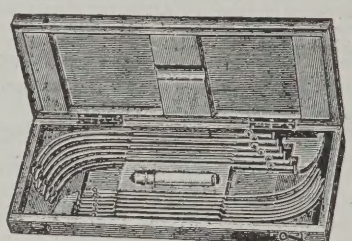

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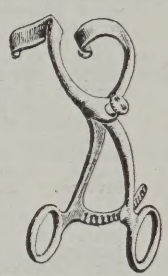

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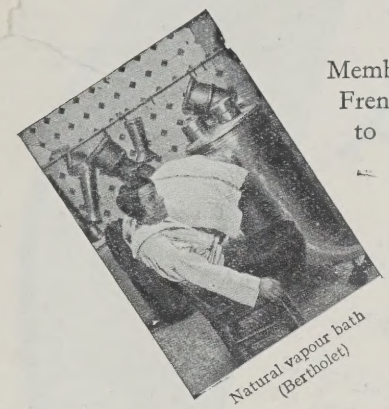

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